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CURTIS'S
BOTANICAL MAGAZINE,

ILLUSTRATING AND DESCRIBING

Plants of the Royal Botanic Gardens of Kew,

AND OF OTHER BOTANICAL ESTABLISHMENTS;

EDITED BY

D. PRAIN, C.I.E., LL.D., F.R.S.
DIRECTOR, ROYAL BOTANIC GARDENS, KEW.

VOL. V.
OF THE FOURTH SERIES.
(*Or Vol. CXXXV. of the Whole Work.*)

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> Grew in that garden in perfect prime.
> SHELLEY.

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1910

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KEEPER OF THE ROYAL BOTANIC GARDEN, GLASNEVIN,

WHOSE SYMPATHY WITH

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IS PRACTICALLY MANIFESTED IN

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OF INTERESTING SUBJECTS,

THIS VOLUME

IS CORDIALLY DEDICATED.

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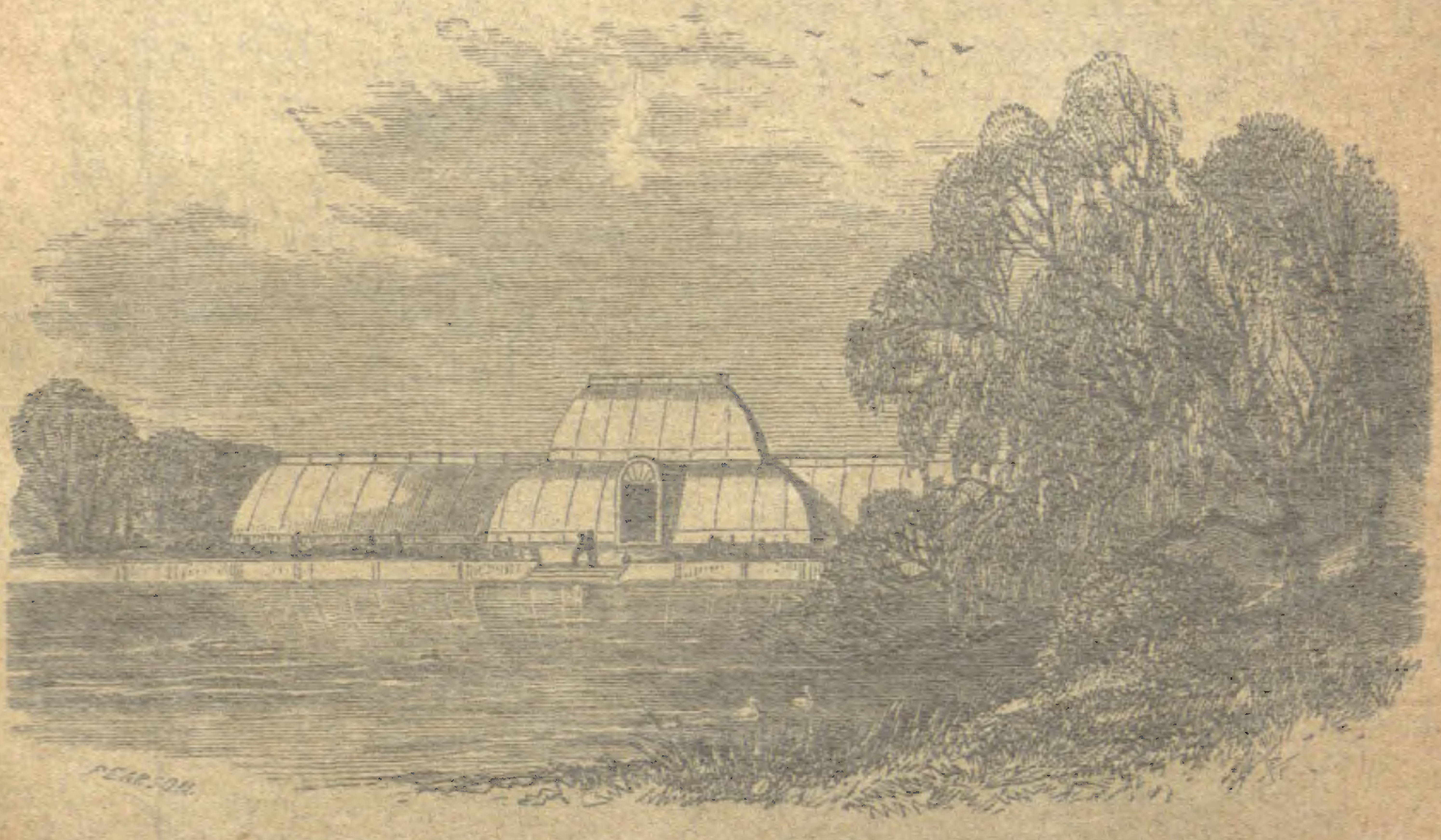

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Itself doth offer."

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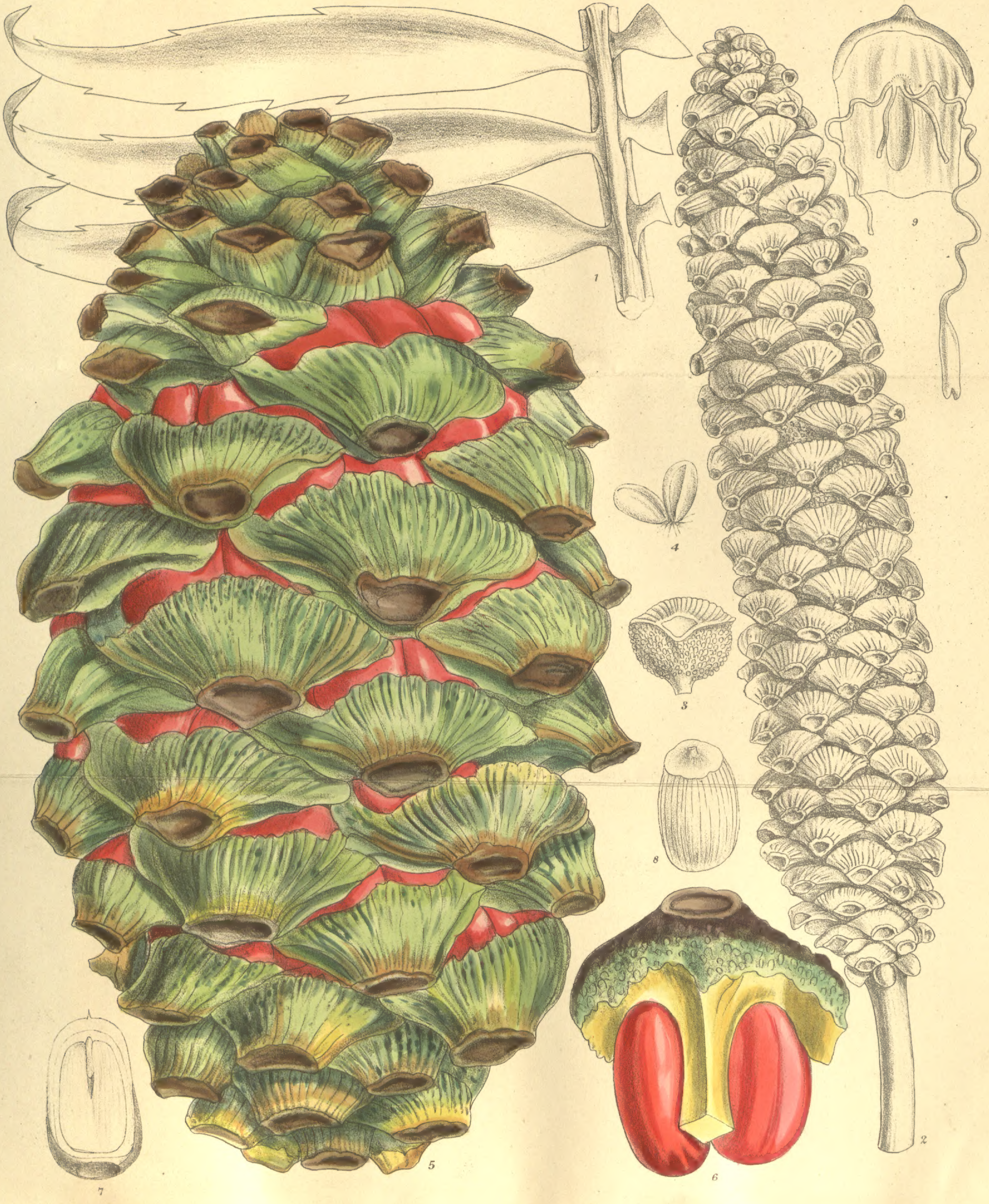

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TAB. 8232.

ENCEPHALARTOS BARTERI.

West Tropical Africa.

CYCADACEAE. Tribe ENCEPHALARTEAE.

ENCEPHALARTOS, *Lehm.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 445.

Encephalartos Barteri, *Carruth. ex Miq. in Arch. Néerl.* vol. iii. p. 243; *Nieuwe Bijdr. Cycad.* p. 46; species *E. villoso*, Lem., similior, a qua frondium segmentis brevioribus spinulis marginalibus minoribus, squamisque strobilorum utriusque sexûs margine inferiore integris apice cicatrice truncata ornatis differt.

Truncus ellipsoideus, 30 cm. altus, 20–25 cm. diametro, frondium basibus griseo-hirsutis persistentibus arcte imbricatis obtectus. *Folia* erecta vel suberecta, 1–1·5 m. longa, petiolo 10–25 cm. longo rhachique primum griseo-hirsutis subcylindricis, segmentis utrinque circa 80 patentibus lineari-lanceolatis basi aliquanto angustatis, 10–12 cm. longis, 1·5–2 cm. latis, apice pungentibus margine utrinque paucispinulosis, spinulis saepissime minutis; segmenta inferiora sensim reducta. *Strobilus* masculus distincte pedunculatus pedunculo gracili 4–6 cm. longo, subcylindricus, 12–18 cm. longus, 4 cm. crassus, squamis 2 cm. latis deltoideis brevissime stipitatis, apice triangulari subpeltato, margine inferiore subintegro. *Strobilus* foemineus olivaceus, oblongo-ellipsoideus, 20 cm. longus, 12 cm. crassus, squamis majoribus 6 cm. latis stipitatis apice peltiformibus lato-rhombeis, angulis lateralibus explanato-deflexis, margine inferiore integris. *Semina* oblongo-ovata, kermesina, 3·5 cm. longa, 2·5 cm. lata; embryo anguste subcylindraceus, 5 cm. longus in filum spiraliter tortum 4 cm. longum desinens; fila sterilia cum fertili consociata saepe breviora, 1–2 cm. tantum longa.—D. PRAIN.

The African genus *Encephalartos* includes twenty-four species. The precise habitat of four of these is obscure; of the remainder fourteen are South African and six are natives of Tropical Africa. Four of the known South African species have already been figured in this work: *E. Altensteinii* (B. M. t. 7162); *E. Caffer* (B. M. t. 4903); a form of *E. horridus* (B. M. t. 5371); and *E. villosus* (B. M. t. 6654). *E. Barteri*, the Tropical African plant now dealt with, in habit and appearance most resembles the South African species last named, but is readily distinguished by the diagnostic characters given above.

E. Barteri, known in West Africa as the Pardi Attar or "Ghost Palm," was originally met with during Dr. Baikie's

Niger Expedition of 1858, when it was collected by the late Mr. C. Barter "three miles south of Jebu on the Yoruba side." The discovery afforded the first evidence of the existence of the genus in Tropical Africa. The name proposed for the species by Mr. Carruthers was taken up by Professor Miquel and is not invalidated by the fact that in his original account Miquel associated with Barter's specimens the leaves of another species from Natal. The species was again met with on the Upper Volta in 1865 by the Rev. C. Schönfeld of the Gold Coast Basel Mission. Schönfeld took advantage of the re-opening of this territory after Sir John Glover's campaign to revisit the Upper Volta and bring back with him an old full-grown tree and a further supply of botanical specimens which he sent to Kew in 1875. Further material was communicated in 1882 by Commander R. M. Rumsey, R.N., and in 1890 Sir A. Moloney sent a supply of living plants which he had secured, from Anum on the Upper Volta, through the co-operation of the Basel Mission. In 1898 more material was sent from the Gold Coast by Mr. W. H. Johnson; there is also at Kew a leaf obtained in Dahomey, 300 miles from the Coast, by the younger Mr. Poisson. Early in 1908 Mr. J. Anderson sent to Kew a number of living plants and fresh female cones from Labo Labo on the Volta. One of these cones is now figured; the male cone depicted was collected by Barter; the embryo and suspensors have been drawn from a preparation by Mr. Hemsley.

Barter only met with the plant in one locality "in a dry rocky valley" and Schönfeld, in a letter to Sir J. D. Hooker, speaks of it as only occurring on rocky hills "shooting out of the crevices of the rocks." The stem is described by Barter as hardly rising above the surface of the soil, the largest seen by him being 1 ft. in height and 9 in. across.

The striking name of "Ghost Palm," independently recorded for the plant by Schönfeld, Rumsey and Moloney, is explained by Schönfeld as being used to express the absence of all virtues from this plant as compared with the valued Oil Palm, *Elaeis guineensis*. Moloney, however, (Forestry of West Africa, p. 215,) records, as illustrative of the difficulty in obtaining reliable information in matters of this kind, an alternative explanation which attributes malignant qualities to this handsome species.

CULTIVATION.—A barrel containing a number of stems of *E. Barteri* was received at Kew in 1890 from the Botanic Station, Lagos. Some of these stems were distributed to various botanic gardens, others were planted at Kew. The plants, however, did not long survive; nor have stems subsequently received lived for more than about three years. While, however, this has been the case as regards this cycad, *E. villosus*, the species to which *E. Barteri* appears most closely allied, is perfectly happy under cultivation; it cones regularly in the Palm House at Kew and is one of the most handsome of cycads. In both species the stem is conical and it may be that in a wild state both are deciduous. At Kew *E. Barteri* rarely has more than three leaves, and although carefully grown in a moist tropical house, only one of the stems has produced a cone. The largest stems received at Kew have not exceeded a foot in height.

DESCRIPTION.—*Stem* short, rarely exceeding 1 ft. in height and 9 in. across, closely covered with persistent imbricated leaf-bases clothed with grey cottony tomentum. *Leaves* erect or suberect, 3½–5½ ft. long, 9–10 in. wide towards the apex, bright green; petiole and rachis subcylindric, clothed at first with a deciduous grey tomentum; leaflets usually about 80 pairs, opposite or some near the apex only subopposite, rather close-set, linear-lanceolate, ½–¾ in. wide, somewhat narrowed at the base, apex pungent, margin with few ascending small teeth; lower leaflets diminishing downwards and passing ultimately into weak spines. *Male cone* peduncled, pale, narrow-cylindric, 5–9 in. long, 2 in. wide; scales spreading, deltoid, very shortly stipitate, subpeltate, triangular, ¾ in. wide, inferior margin entire. *Female cone* subsessile, dark olive, oblong-ellipsoid, 8 in. long, 5 in. wide; scales long-stalked, apex obliquely deflexed, peltate, wide-rhomboid with the lateral angles explanate, 2¼ in. across, inferior margin entire. *Seeds* ovoid-oblong, faintly angled, at length protruded between the scales of the mature cone, 1¼ in. long; testa crimson.

Fig. 1, part of a leaf; 2, male cone; 3, male scale; 4, pollen; 5, female cone; 6, scale with seeds; 7, section of a seed; 8, seed with testa removed; 9, part of a seed with embryo attached to suspensor and with barren suspensors;—4 *and* 9 *enlarged.*

8233

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TAB. 8233.

ANGADENIA NITIDA.

Tropical South America.

APOCYNACEAE. Tribe ECHITIDEAE.

ANGADENIA, *Miers, Apocyn. S. Amer.* p. 173.

Angadenia nitida, *Miers, Apocyn. S. Amer.* p. 177; species *A. hypoglaucae,* Miers, affinis; foliis tamen subtus minutissime papilloso-pruinosis, corollae tubo graciliore parte infrastaminali breviore parte suprastaminali magis infundibuliformi differt.

Frutex scandens, omnino glaber, ramis dextrorsum circumvolventibus gracilibus teretibus laevibus. *Folia* oblonga vel elliptica, basi minute cordata, apice acuta vel in eadem planta obtusissima, saepe cuspidulata, 8–15 cm. longa, 3–6 cm. lata, chartacea, supra laete viridia, nitida, subtus ob papillas minutissimas creberrimas pruinosa, nervis lateralibus utrinque 12–15 patulis, venis transversis pulchre arcuatis supra prominulis; petiolus flexuosus, 1–1·5 cm. longus. *Inflorescentiae* axillares, racemoso-cymosae, cum pedunculo gracili flexuoso 8–12 cm. longae, floribus superne approximatis, nutantibus; bracteae ovatae, tenues; pedicelli 1–1·5 cm. longi. *Sepala* ovata, obtusa, superne membranacea, 4–5 mm. longa, intus glandula ad basin trifida instructa. *Corolla* praeter annulum cinnabarinum ad staminum insertionem situm sulphurea, 4 cm. longa; tubus basi angustus, ad staminum insertionem constrictus, abhinc in flore plane aperto gradatim infundibuliformiter ampliatus et magis minusve tortus, ad limbi sinus 3 cm. longus, limbi segmenta oblique rotundato-ovata, brevissime subacuminata, 1·25 cm. longa. *Stamina* 8 mm. supra corollae basin inserta; antherae subulatae, dorso scaberulae, basi breviter sagittatae, 6 mm. longae. *Discus* cupularis, breviter 5-lobatus, ovarium ad medium cingens. *Ovarium* glabrum; stylus filiformis; stigma ellipsoideum, basi annulo cinctum. *Folliculi* anguste lineari-lanceolati, paralleli, teretes, ad 20 cm. longi, 0·5 cm. lati, pericarpio laevi, tenui. *Semina* fusiformia, 2·25–2·5 cm. longa, rostro tenui 0·6–1 cm. longo incluso; coma sordide alba, 5 cm. longa. *Echites nitida,* Vahl. Ecl. vol. ii. p. 19, t. 13. *Odontadenia nitida,* Muell.-Arg. in Mart. Fl. Bras. vol. vi. pars 1, p. 118. *O. cordata,* A.DC. Prodr. vol. vii. p. 360.—O. STAPF.

Dr. Stapf finds that the South American Echitideae, more particularly those referred at one time or another to *Echites* and the more nearly allied genera, are in a state of such confusion as to stand in urgent need of revision. The most recent attempt to elucidate the affinities of the species in this group was that of Miers, whose memoir, "Apocynaceae of South America," based on somewhat scanty material, is not

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altogether satisfactory. Dr. Stapf points out that *Odontadenia*, to which Mueller has referred the plant here figured, is characterised by the very short, almost subglobose infrastaminal portion of the corolla-tube, the densely tomentose anthers and the very firm woody follicles explanate when they dehisce and then over 2½ in. across. Within his *Angadenia*, Miers has aggregated 26 species which are far from uniform in appearance. Dr. Stapf therefore proposes to treat *Angadenia* in a narrower sense, limiting the name to a smaller group of obviously allied forms more or less resembling *A. nitida* in facies. This restricted *Angadenia* includes Miers' species *A. hypoglauca*, *A. coriacea*, *A. elegans* and *A. geminata* and appears to be confined to North-Eastern Brazil, Guiana and Trinidad.

CULTIVATION.—*A. nitida*, which extends from Para through Guiana to Trinidad, was received at Kew in 1906 from the Trinidad Botanic Gardens where it was known as *Echites neriandra.* It has grown freely in a tropical house, its shoots extending for several yards along the rafters under the roof, and flowering freely in July, when it had the appearance of a small-flowered yellow *Dipladenia.* The flowers although not brightly coloured are pleasing and the leafy shoots always look healthy. A useful plant for clothing a pillar in a tropical house, it ought in tropical countries to be as serviceable on a trellis as the Passifloras.

DESCRIPTION.—*Shrub*, glabrous, climbing; branches twining to the right. *Leaves* oblong or elliptic, acute or obtuse, often slightly cuspidate, entire, slightly cordate, lateral nerves 12–15 on each side, bright green and shining above, pruinose beneath, chartaceous, 4–6 in. long, 1¼–2½ in. wide; petiole slender, ⅓–½ in. long. *Inflorescence* of axillary, racemiform cymes, their peduncles slender, 3–5 in. long, the flowers approximate upwards, nodding; bracts ovate; pedicels ⅓–½ in. long. *Sepals* ovate, obtuse, membranous above, under ¼ in. long, glandular at the base within. *Corolla* yellow with a vermilion band opposite the insertion of the stamens, 1½ in. long; tube narrow below and constricted at the staminal insertion, above narrowly funnel-shaped, somewhat contorted; lobes oblique, ovate-rotund, subacuminate, ½ in. long. *Stamens* inserted ⅓ in. above base of corolla-tube; anthers subulate, scaberulous behind, shortly sagittate, $\frac{1}{4}$ in. long. *Disk* cup-shaped, shortly 5-lobed, surrounding lower half of ovary. *Ovary* glabrous; style filiform; stigma ellipsoid, annulate at base. *Follicles* narrow linear-lanceolate, parallel, terete, up to 8 in. long, $\frac{1}{5}$ in. wide; pericarp thin, smooth. *Seeds* fusiform, about 1 in. long, beak slender; coma dirty white, 2 in. long.

Fig. 1, section of corolla-tube; 2, sepal; 3 and 4, anthers; 5, ovary; 6, stigma:—*all enlarged.*

8234

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Tab. 8234.

ERIA RHYNCHOSTYLOIDES.

Java.

Orchidaceae. Tribe Epidendreae.

Eria, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 509.

Eria rhynchostyloides, *O'Brien in Gard. Chron.* 1907, vol. xlii. p. 370; *Kew Bulletin,* 1908, App. iii. p. 87; aff. *E. leucostachyae*, Lindl., sed pseudobulbis brevibus et crassis, pedicellis longioribus, et labelli lobis lateralibus auriculatis differt.

Herba epiphytica. *Pseudobulbi* aggregati, oblongi, subcompressi, 5–10 cm. longi, 2–4 cm. lati, vaginis membranaceis vestiti, 3–4-phylli. *Folia* oblongo-lanceolata vel elongata, acuta, erecta vel recurva, coriacea, 15–30 cm. longa, 2–3 cm. lata. *Scapi* axillares vel subterminales, breviter pedunculati, crassiusculi, 15–20 cm. longi; racemi arcuati, cylindrici, densiflori, pubescentes. *Bracteae* elliptico-oblongae, obtusae, subconcavae, reflexae, 5–7 mm. longae. *Pedicelli* graciles, sparse pubescentes, 6–8 mm. longi. *Flores* parce pubescentes, albidi, columnis purpureis. *Sepalum* posticum elliptico-oblongum, obtusum, subconcavum, erectum, 5–6 mm. longum; *sepala* lateralia late triangulari-ovata, obtusa, 5–6 mm. lata; mentum 5–6 mm. longum. *Petala* lanceolata, obtusa, 5–6 mm. longa. *Labellum* trilobum, 5 mm. longum; lobi laterales auriculati, concavi, parvi; lobus intermedius unguiculatus, late ovato-orbicularis, obtusus, 3 mm. latus, marginibus recurvis. *Columna* lata, 2 mm. longa, purpurea.—R. A. Rolfe.

Eria rhynchostyloides is a recent addition to the genus which belongs to the section *Urostachya*, Lindl., and is allied to *E. floribunda*, Lindl., and *E. leucostachya*, Lindl., but is remarkable in the section for its short stout pseudobulbs. A photograph of this species was first sent to Kew from Paris in 1894 by Mr. Godefroy-Leboeuf who stated that it had been obtained from Java. It could not be identified, but in the absence of specimens it was not described. There are several species from Java which are imperfectly known, but none of them appear to Mr. Rolfe to resemble the one now described.

Cultivation.—The plant now figured, which is that on which the original description was based, was presented to Kew early in 1908 by the Hon. Walter Rothschild, Tring.

It flowered in August, producing three spikes like the one shown in plate 8234, and was, for an *Eria*, decidedly attractive. As cultivated in a tropical house, where it is planted in a pot filled with peat fibre and sphagnum, it has grown vigorously. Its behaviour at Kew suggests that it is likely to prove an easily managed and freely flowering species.

Description.—*Herb*, epiphytic. *Pseudobulbs* clustered, oblong, sub-compressed, 2–4 in. long, $\frac{3}{4}$–$1\frac{1}{2}$ in. wide, clothed with membranous sheaths. *Leaves* 3–4, oblong-lanceolate or elongate, acute, erect or recurved, coriaceous, 6 in.–1 ft. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. wide. *Scapes* axillary or subterminal, short-peduncled, rather stout, 6–8 in. long; racemes curved, cylindric, dense-flowered, pubescent; bracts elliptic-oblong, obtuse, subconcave, reflexed, $\frac{1}{4}$–$\frac{1}{3}$ in. long; pedicels slender, sparingly pubescent, slightly longer than bracts. *Flowers* sparingly pubescent, whitish with a purple column; sepals about $\frac{1}{4}$ in. long, obtuse, posterior elliptic-oblong, subconcave, erect, lateral wide triangular-ovate; mentum as long as sepals. *Petals* lanceolate, obtuse, under $\frac{1}{4}$ in. long; lip 3-lobed, as long as petals, its lateral lobes auriculate, concave, small, the mid-lobe clawed, widely ovate-orbicular, obtuse, $\frac{1}{8}$ in. wide with recurved margins. *Column* wide, $\frac{1}{12}$ in. long, purple.

Figs. 1 and 2, flowers; 3, column and lip; 4, anther-cap: 5, pollinia:—*all enlarged.*

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TAB. 8235.

CLERODENDRON UGANDENSE.

Tropical Africa.

VERBENACEAE. Tribe VITICEAE.

CLERODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1155.

Clerodendron (Cyclonema) **ugandense,** *Prain*; species *C. myricoidi*, R. Br., quam maxime affinis, calycis lobis multo minoribus, corollae tubo manifeste breviore aliisque notis satis differt.

Frutex 1–3 m. altus, ramis glabris. *Folia* saepius opposita, elliptica vel anguste obovata, grosse serrata, apice acuta, basi in petiolum brevem angustata, 4–12 cm. longa, 2–6 cm. lata, glabra vel glabriuscula. *Cymae* laxae, pauciflorae, paniculatae. *Calyx* glaber, 6–7 mm. longus, campanulatus; lobi rotundati, apice rubescentes. *Corolla* valde zygomorpha; tubus 5–6 mm. longus, sursum curvatus; lobus anticus 2 cm. longus, concavus, ambitu pyriformis, caeruleo-violaceus; ceteri 1 cm. longi, plani, obovati, pallide caerulei. *Filamenta* purpurea, valde exserta, ascendentia, incurva, inferne barbata; antherae caerulescentes. *Ovarium* orbiculare, 3 mm. diametro; stylus filamenta paullo superans, apice inaequaliter 2-fidus.—D. PRAIN.

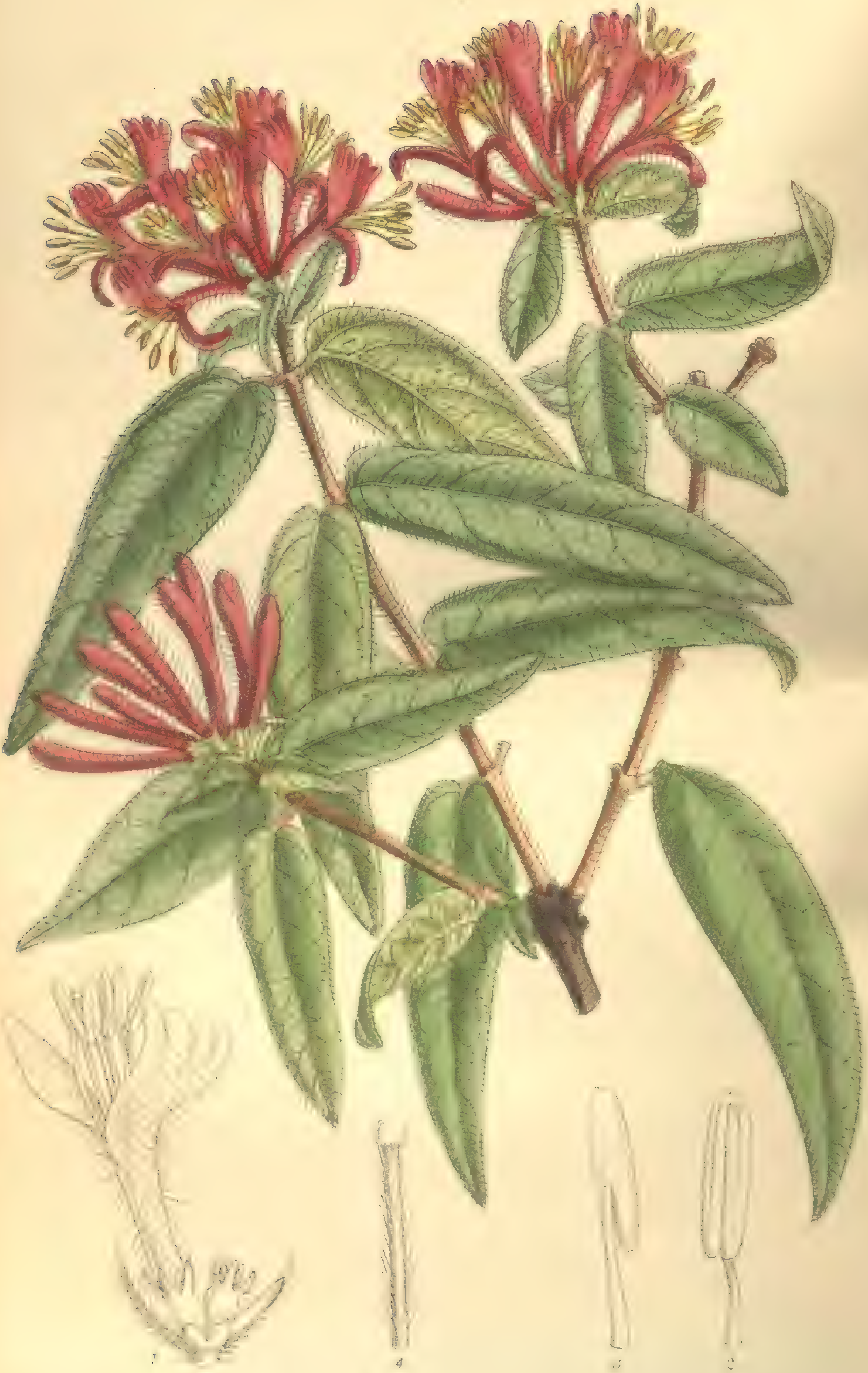
The species of *Clerodendron* referable to the section *Cyclonema* are characterised by having the lowest corolla-lobe considerably larger than the other lobes. The section includes ten or twelve distinct forms, all of which are African. Of these only one has hitherto been figured in this work (B. M. t. 5838) as *Cyclonema myricoides*, Hochst. (*Clerodendron myricoides*, R. Br.), itself, as at present understood, a somewhat variable species. From *C. myricoides* as there delineated the form now figured differs in having much shorter semi-orbicular calyx-lobes, a shorter corolla-tube and larger more deeply coloured corolla-lobes.

CULTIVATION.—Seeds of *C. ugandense* were forwarded to Kew in 1906 by Mr. M. T. Dawe, who had collected them in Voi, Uganda, at 2,000 ft. above sea-level. The plants have grown freely in an intermediate house, quickly forming shrubs from 2–3 ft. in height, with long slender leafy branches terminated by loose racemes of beautiful blue flowers. Cuttings formed of the young shoots root readily, and some plants raised in this manner flowered freely in October, the one figured having flowered in August. Its behaviour under cultivation and the elegance and attractive colour of its flowers afford promise that the plant may prove useful in gardens, more especially as a winter-flowering decorative greenhouse shrub.

DESCRIPTION.—*Shrub*, 3–10 ft. high; branches glabrous. *Leaves* usually opposite, elliptic or narrow-obovate, acute, coarsely toothed, base narrowed to a short petiole, 1½–4½ in. long, ¾–2½ in. wide, glabrous. *Cymes* lax, few-flowered, paniculate. *Calyx* glabrous, about ¼ in. long, campanulate; lobes rounded, with reddish tips. *Corolla* irregular; tube ⅕–¼ in. long, curved upwards; anterior lobe ¾ in. long, concave, pyriform in outline, violet-blue, the others ⅓ in. long, flat, obovate, pale blue. *Filaments* purple, much exserted, arched upwards, bearded towards base; anthers blue. *Ovary* orbicular, ⅛ in. across; style rather longer than filaments, unequally 2-lobed.

Fig. 1, calyx and ovary; 2, flower, laid open; 3 and 4, stamens; 5, apex of style showing stigma: —*all enlarged.*

8236



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TAB. 8236.

LONICERA GIRALDII.

China.

CAPRIFOLIACEAE. Tribe LONICEREAE.

LONICERA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 5.

Lonicera (Nintooa) Giraldii, *Rehder in Rep. Missouri Bot. Gard.* vol. xiv. 1903, p. 150; *S. Mottet in Rev. Hort.* 1907, p. 299, fig. 98; affinis *L. acuminatae*, Wall., a qua foliis angustioribus dense hirsutis differt.

Frutex, ramis gracilibus junioribus dense flavo-tomentosis. *Folia* oblongo-lanceolata vel lanceolata, acuminata, basi cordata, 3–9 cm. longa, 1·5–2·5 cm. lata, utrinque dense hirsuta; petioli usque ad 1 cm. longi, tomentosi. *Paniculae* terminales, breves; pedunculi breves; bracteae subulatae, pilosae, circiter 3 mm. longae; bracteolae ovatae, ciliatae. *Calycis* dentes lanceolatae, 1 mm. longae, longe pilosae. *Corolla* bilabiata; tubus 1 cm. longus, extus dense flavo-pilosus; labium superum 3–4-lobatum, 1 cm. longum, lobis ovatis subacutis 2 mm. longis; labium inferum oblongum, vix 1 cm. longum, 2 mm. latum. *Stamina* subaequalia, filamentis infra medium parce pilosis, antheris exsertis 4–5 mm. longis. *Stylus* exsertus, 2 cm. longus, pilosus. *Fructus* globosus, atropurpureus, 5 mm. diametro, calycis dentibus persistentibus.—J. HUTCHINSON.

For the introduction of this striking Honeysuckle horticulture is indebted to Mr. M. L. de Vilmorin, by whom seeds were first obtained from Szechuen in 1899 and with whom it first produced flowers in 1903. The plants which yielded the specimens from which the present figure was prepared flowered in 1908 in the establishment of Messrs. Vilmorin-Andrieux at Verrières-le-Buisson, whence material was sent to Kew in June, and again in October last. Although very nearly allied to *L. acuminata*, Wall., a Himalayan species, this Chinese plant, Mr. Hutchinson points out, is readily distinguished by the somewhat narrower leaves which are clothed on both surfaces with a dense, yellowish, somewhat stiff indumentum.

In his careful synopsis of the genus *Lonicera*, Rehder has proposed a new subsection of the section *Nintooa* for the accommodation of *L. Giraldii* and ten other species that are distributed from Central Asia and the Himalaya south-eastward to the Malayan Archipelago. The species of this subsection, the Breviflorae, are characterised by small flowers about an inch long and by purplish-black fruits.

DESCRIPTION.—*Shrub*; branches slender, when young tawny-tomentose. *Leaves* oblong-lanceolate or lanceolate, acuminate, base cordate, 1–3½ in. long, ½–1 in. wide, densely hirsute on both surfaces; petiole ¼–⅓ in. long. *Panicles* terminal, short; peduncles short; bracts subulate, pilose, ⅛ in. long; bracteoles ovate, ciliate. *Calyx-teeth* lanceolate, very short, with long hairs. *Corolla* 2-lipped; tube ⅓ in. long, densely yellow-pubescent outside; upper lip 3–4-lobed, as long as tube; lower lip oblong, rather shorter than upper. *Stamens* exserted, subequal; filaments sparingly hairy below the middle; anthers about ⅕ in. long. *Style* exserted, ¾ in. long, pilose. *Fruit* globose, purplish-black, ⅕ in. across, crowned by the persistent calyx-lobes.

Fig. 1, flower; 2 and 3, anthers; 4, style:—*all enlarged.*

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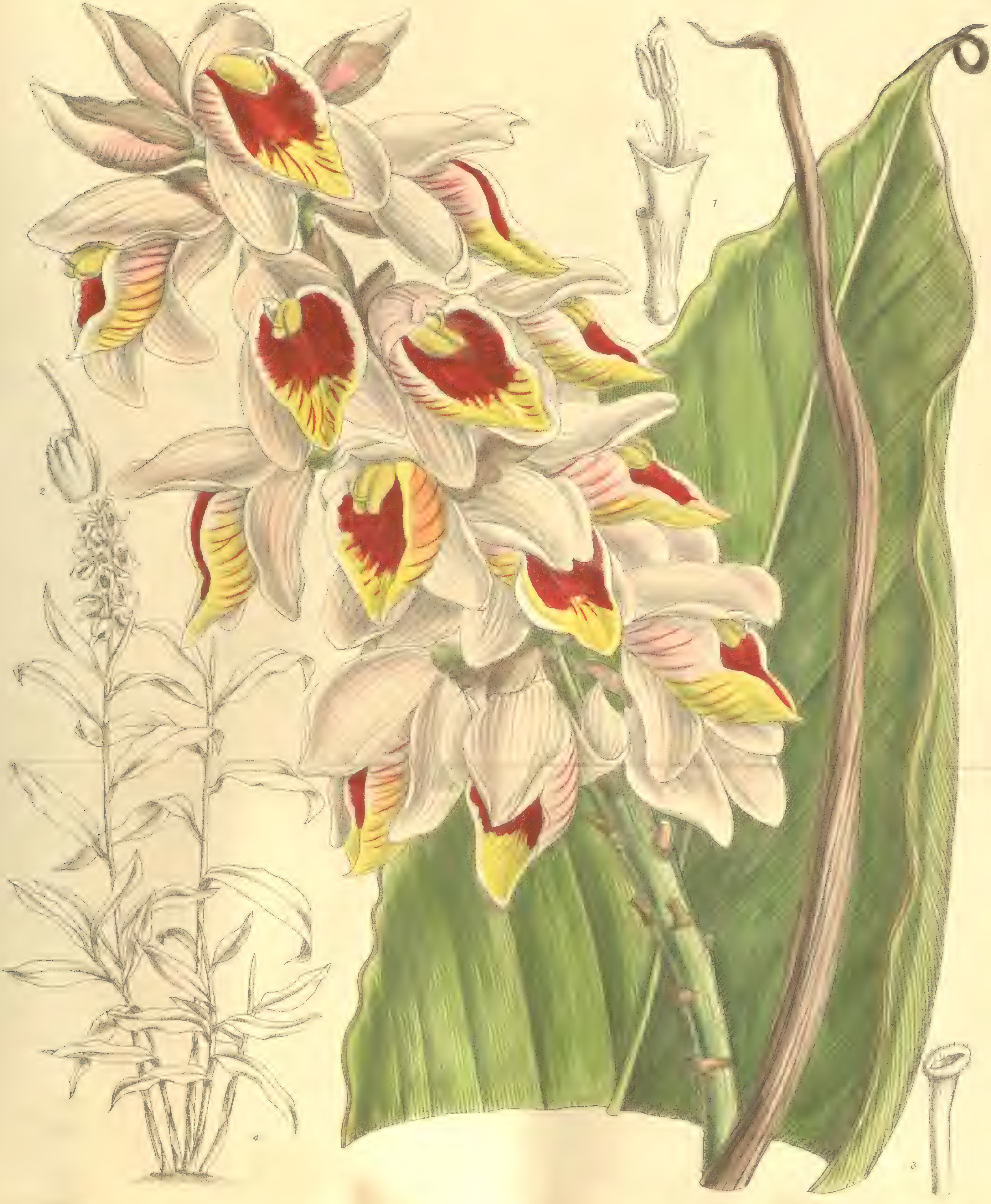

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TAB. 8237.

ALPINIA BRACTEATA.

Eastern Himalaya.

SCITAMINEAE. Tribe ZINGIBERACEAE.

ALPINIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 648; *Petersen in Engl. & Prantl, Nat. Pflanzenfam.* vol. iii. pars vi. p. 23.

Alpinia bracteata, *Roxb. Hort. Beng.* p. 2 (1811); *Fl. Ind.* ed. Carey and Wall. i. p. 61 (1820); *Baker in Hook. f. Fl. Brit. Ind.* vol. vi. p. 255; *K. Schum. in Engl. Pflanzenr. Zingib.* p. 336; species *A. nutanti*, Rosc., affinis, racemo simplici, bracteolis viridibus differt.

Herba perennis. *Caulis* erectus, 1–2 m. altus. *Folia* ad 60 cm. longa, 15 cm. lata, ovato-oblonga, acuminata, superiora lanceolata, supra glabra, subtus tomentosa pallidiora, marginibus dense ciliatis; vagina circiter 20 cm. longa; ligula obtusa, glabra; petioli 2 cm. longi, alte canaliculati. *Racemi* terminales, erecti, simplices, 12–20 cm. longi; rhachis dense hirsuta; pedicelli breves, hirsuti; bracteae virides, ellipticae. *Calyx* campanulatus, unilateraliter fissus, 8 mm. longus. *Corollae* tubus infundibuliformis, 8 mm. longus; lobi oblongi, 3·5 cm. longi, 1·5 cm. lati, albi roseo tincti. *Labellum* corollae lobis paullo longius, ovatum, concavum, 4 cm. longum, 2·5–3 cm. latum, extra dilute roseum, intus rubro-purpureum, prope apicem luteum, ad margines dilute roseum. *Filamentum* complanatum, pubescens; staminodia subulata, 4 mm. longa. *Ovarium* subglobosum, dense sericeo-villosum.—*A. Roxburghii*, Sweet, Hort. Brit. ed. 2, p. 493; Horan. Monogr. Scit. p. 34.—C. H. WRIGHT.

Alpinia bracteata belongs to a group of rather closely allied species, and most resembles *A. nutans*, Rosc., which is readily distinguished by its more compound inflorescence, and *A. Henryi*, K. Schum., which has the indumentum on the rhachis more silky in texture. It must not be confounded with the species described as *A. bracteata* by Roscoe in the Transactions of the Linnean Society, vol. xi. p. 281 (1815) "from a Chinese drawing belonging to the Right Hon. Lord Stanley, F.L.S." which has been referred by Schumann both to *A. alata*, A. Dietr., and also, as Mr. Wright points out, to *A. calcarata*, Roxb.

The plant from which the figure now given was made, was raised at Kew from seeds received from the Royal Botanic Garden, Calcutta, in 1882. It flowered at Kew for the first time in a tropical house in May, 1908. The species

FEBRUARY, 1909.

was, however, first introduced to European cultivation in 1820, and a plant had already flowered at Kew in 1864.

CULTIVATION.—The species now figured, like the other Alpinias, thrives well when grown as a swamp plant in a strong loamy well-manured soil with a constant supply of moisture and a high temperature. An ideal place for such plants is a tropical aquatic house where the soil about the roots can be kept in a mud-like condition while the stems are exposed to abundant sunshine. The flowers of the various species of *Alpinia* are somewhat fugacious, but while fully open they are very effective.

DESCRIPTION.—*Herb*; perennial. *Stem* erect, 3–7 ft. high. *Leaves* up to 2 ft. in length, 6 in. wide, ovate-oblong, the uppermost lanceolate, acuminate, glabrous above, paler and tomentose beneath, the margins closely ciliate; leaf-sheaths about 8 in. long with an obtuse, glabrous ligula; petioles $\frac{3}{4}$ in. long. *Racemes* terminal, erect, simple, 5–8 in. long, with densely hirsute rhachis and short hirsute pedicels; bracts green, elliptic. *Calyx* campanulate, split on one side, $\frac{1}{3}$ in. long. *Corolla-tube* funnel-shaped, $\frac{1}{3}$ in. long; lobes oblong, $1\frac{1}{2}$ in. long, $\frac{2}{3}$ in. wide, white with a pink tinge. *Labellum* rather longer than corolla-lobes, ovate, concave, $1\frac{3}{4}$ in. long, $2–2\frac{1}{4}$ in. wide, pale rose without, within reddish-purple, with pale rose margins and yellow tip. *Filament* flattened, pubescent; staminodes subulate, $\frac{1}{6}$ in. long. *Ovary* subglobose, densely silky.

Fig. 1, flower, corolla-lobes removed; 2, epigynous disk and style-base; 3, style-apex and stigma; 4, entire plant, showing habit:—1–3 *enlarged*, 4 *much reduced*.

8238

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TAB. 8238.

OLIGOBOTRYA HENRYI.

China.

LILIACEAE. Tribe POLYGONATEAE.

OLIGOBOTRYA, *Baker in Hook. Ic. Pl.* t. 1537.

Oligobotrya Henryi, *Baker, l.c.*; species unica.

Herba. *Caulis* erectus, ad 10 dm. altus, 4 mm. diametro, flexuosus, pubescens, viridis, purpureo-maculatus. *Folia* obovato-oblonga vel ovata, breviter acuminata, 10 cm. longa, 4·5 cm. lata, sessilia vel breviter petiolata, basi rotundata, plus minusve pubescentia praesertim ad nervos, multinervia. *Racemi* terminales, simplices vel ramosi; pedicelli tenues, 2 mm. longi; bracteolae minutae, ovatae, pubescentes. *Perianthium* album vel dilute luteum; tubus cylindricus, 8 mm. longus, 3 mm. diametro, basi obtusus; lobi patentes, oblongo-ovati, obtusi. *Stamina* ad corollae faucem affixa filamenta brevissima; antherae oblongae, obtusae. *Ovarium* ovoideum; stylus subulatus, ovario paullo longior; stigma lobis 3 triangularibus instructum.

Var. **violacea,** *C. H. Wright*, var. nov. *Perianthii* tubus extra violaceus, lobi pallidiores.—C. H. WRIGHT.

The genus *Oligobotrya* is intermediate between *Smilacina*, of which it has the habit and the terminal inflorescence, and *Polygonatum*, with which it agrees in having a gamophyllous perianth. The specimens on which the original description of *O. Henryi* was based were sent to Kew in 1886 by Mr. A. Henry, who had obtained them at Patung in Hupeh, Central China. Since then the species has been met with in the adjoining provinces of Hunan and Szechuan. The specimens here figured were received from Messrs. J. Veitch & Sons, for whom it had been obtained by Mr. E. H. Wilson. The original description states that the leaves are glabrous, but Mr. Wright finds that although the leaves of the specimens first communicated bear comparatively few hairs, these are not entirely absent. In other specimens, however, the leaves bear numerous hairs as shown in the figure. Some of the wild specimens in the Kew collection are of very vigorous habit and have a much-branched inflorescence.

FEBRUARY, 1909.

CULTIVATION.—The plants from which the plate here given has been prepared were grown, Messrs. Veitch inform us, at their Coombe Wood Nursery in a very shady and moist border of leaf-mould and peat. They find that the same treatment as that accorded to the hardy Cypripediums appears to suit this plant.

DESCRIPTION.—*Herb.* *Stem* erect, sometimes over 3 ft. high, $\frac{1}{6}$ in. thick, flexuous, green with purple blotches, pubescent. *Leaves* sessile or shortly petioled, ovate-oblong or ovate, shortly acuminate, rounded at the base, many-nerved, more or less pubescent especially on the nerves, 4 in. long, $1\frac{1}{2}$–2 in. broad. *Racemes* terminal, simple or branching; pedicels slender, $\frac{1}{12}$ in. long; bracteoles very small, ovate, pubescent. *Perianth* usually white or pale yellow, or (var. *violacea*) with violet tube and pale violet lobes; tube cylindric, $\frac{1}{3}$ in. long, $\frac{1}{8}$ in. wide, base truncate; lobes spreading, oblong-ovate, obtuse. *Stamens* adnate to corolla-throat; filaments very short; anthers oblong, obtuse. *Ovary* ovoid; style subulate, rather longer than ovary; stigma 3-lobed, lobes triangular.

Fig. 1, section of flower (var. *violacea*); 2, section of flower (var. *typica*); 3, pistil (var. *violacea*); 4, pistil (var. *typica*):—*all enlarged.*

[illegible]

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TAB. 8239.

ERANTHEMUM WATTII.

Northern India.

ACANTHACEAE. Tribe RUELLIEAE.

ERANTHEMUM, *Linn.*; *R. Br. Prodr.* p. 477; *Lindau in Engl. & Prantl, Nat. Pflanzenfam.* vol. iv. pars iii. B, p. 311.

Eranthemum Wattii, *Stapf*; affinis *E. nervoso*, Roem. & Sch., sed statura humiliore, spicis brevioribus, corollis purpureis, staminibus inclusis, filamentis antheris duplo brevioribus differt.

Herba perennis, 20–25 cm. alta, ramosa, ramis quadrangularibus ad angulos minute puberulis. *Folia* ovata, breviter acuminata, basi abrupte cuneata vel rotundata, 6–10 cm. longa, 4–5·5 cm. lata, firmula, saturate viridia, ad margines et infra secus nervos scabridula, nervis lateralibus utrinque 8–9, subtus venisque transversis prominentibus; petiolus 1–3·5 cm. longus, superne ob laminam saepe decurrentem magis minusve alatus. *Spicae* superne in paniculam foliatam aggregatae, sub anthesi circiter 2 cm. longae, demum ad 6–7 cm. elongatae, densae; bracteae ovatae vel superiores ovato-lanceolatae, acuminatae, herbaceae 2–2·5 cm. longae, ad margines ciliato-fimbriatae; bracteolae albidae, anguste lanceolatae, circiter 5 mm. longae. *Calyx* albidus, 8 mm. longus, ad medium 5-fidus, segmentis subulato-lanceolatis ad margines scaberulis. *Corolla* purpurea vel violacea; tubus anguste cylindricus, ad 2 cm. longus, sub apice paulo latior; limbus ad 2·5 cm. diametro. *Stamina* in tubo corollae inclusa; antherae vix 2·5 mm. longae, filamentis duplo brevioribus suffultae; staminodia minuta capitata supra stamina in plica insidentia. *Ovarium* glabrum; stylus glaber, stigmate os corollae attingente vel breviter exserto.—*Daedalacanthus parvus*, C. B. Clarke in Kew Handlist Tend. Dicot. 1899, p. 225 (nomen). *D. Wattii*, Bedd. in Gard. Mag. 1901, p. 644 cum ic.; Journ. Hort. Soc. vol. xxxiv. 1908, pars i. p. 67.

Horticulture is indebted to Col. R. H. Beddome for the introduction of this distinct species, raised by him from seeds received from Northern India. Its original discovery is attributed to Sir G. Watt, to whom it has been dedicated by Col. Beddome in the original description, accompanied by a good figure, in the Gardeners' Magazine for 1901. No precise locality is given for the wild plant. In habit it most resembles *E. nervosum*, figured in this work (t. 1358) as *Justicia nervosa*.

The use of the name *Eranthemum* for the genus to which these two species belong is explained by Dr. Stapf as

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follows. In recent works the name has usually been applied to a group of forms not closely allied to the original *Eranthemum* of Linnaeus. A century ago R. Brown pointed out that the *Eranthemum* of Linnaeus in the Flora Zeylanica and in all the editions of that author's Genera Plantarum is a Ceylon species allied to Vahl's *Justicia nervosa* and *J. rosea* (*Eranthemum nervosum* and *E. roseum*). To this Ceylon plant Linnaeus, in his Species Plantarum, owing to some confusion of synonymy, gave the inappropriate name *E. capense*. Roxburgh, like Brown, had also taken up *Eranthemum* in the sense of the Flora Zeylanica, describing as *E. montanum* the plant which Linnaeus had already termed *E. capense*.

The conception of *Eranthemum* as a genus based on *E. capense*, Linn. (*E. montanum*, Roxb.), was accepted until 1865, when T. Anderson revised the Indian Acanthaceae. Anderson, some years before, had established a genus *Daedalacanthus* on a Ceylon plant which he knew to be *E. montanum*, Roxb., but did not know to be also the species (*E. capense*, Linn.) on which *Eranthemum*, Linn., was based. When, in his subsequent revision, Anderson with good reason broke up into two genera the incongruous aggregate of forms till then included in *Eranthemum*, he placed in *Daedalacanthus* all the congeners of *D. montanus*, T. And. (*E. capense*, Linn.), on which *Eranthemum*, Linn., had been founded, and retained the name *Eranthemum* for the residual species none of which had been included in *Eranthemum* by Linnaeus.

The confusion thereby created was pointed out in 1883 by Radlkofer who, in reverting to the usage of Brown, Roxburgh and Linnaeus himself as regards *Eranthemum* proper, proposed for the new *Eranthemum*, T. And. (not of Linn.), the name *Pseuderanthemum*. This rectification was overlooked at the time, but has since been repeated by Lindau.

The error has mainly been limited to descriptive works; in horticultural literature Anderson's separation of the genera has not always been recognised, and the name *Eranthemum* is still in common use for the congeners of the plant now described. This separation is nevertheless necessary, for while the two genera have somewhat similar corollas—a circumstance which may explain their treatment as one genus until Anderson pointed out how they differ—their characters are so distinctive as to place them in different tribes. *Eranthemum*, Linn., one of the *Ruellieae*, has contorted corolla-lobes and foveolate pollen; *Pseuderanthemum*, Radlk., one of the *Justicieae*, has imbricate corolla-lobes and banded pollen. There is another and more obvious, though less important, difference in the bracts; in *Eranthemum* these are usually large, in *Pseuderanthemum* they are very small.

Cultivation.—The species of *Eranthemum* are easily cultivated in a warm house. They are best raised annually from spring-struck cuttings, and if the tops be pinched back during the growing season they quickly form shapely little pot-shrubs and flower freely. The well-known *E. nervosum* flowers in winter; the species here figured is at its best in July and August.

Description.—*Herb*; perennial. *Stem* branching, angled, 8-10 in. high. *Leaves* ovate, shortly acuminate, base shortly cuneate or rounded, $2\frac{1}{2}$–4 in. long, $1\frac{1}{2}$–$2\frac{1}{4}$ in. wide, rather firm, dark green, main-nerves 8–9 pairs and secondary nerves conspicuous beneath, margins and nerves beneath slightly scabrid; petiole $\frac{1}{3}$–$1\frac{1}{2}$ in. long, somewhat winged upwards. *Spikes* paniculate, at first about $\frac{3}{4}$ in., ultimately $2\frac{1}{2}$ in. long, dense; lower bracts ovate, upper narrower, acuminate, herbaceous, $\frac{3}{4}$–1 in. long, with ciliate margins; bracteoles whitish, narrow-lanceolate, $\frac{1}{5}$ in. long. *Calyx* whitish, $\frac{1}{3}$ in. long, 5-partite, lobes subulate-lanceolate with margins scaberulous. *Corolla* purple or violet; tube narrow cylindric, about $\frac{3}{4}$ in. long, slightly expanded below the 1 in. wide limb. *Stamens* included; anthers short; filaments very short; staminodes minute, inserted above the stamens. *Ovary* and style glabrous; stigma reaching the corolla-throat or slightly exserted.

Fig. 1, calyx and pistil; 2, part of corolla-tube laid open, showing stamens; 3, ovary · 4, stigma:—*all enlarged.*

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TAB. 8240.

PINUS BUNGEANA.

North China.

CONIFERAE. Tribe ABIETINEAE.

PINUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 438.

Pinus Bungeana, *Zucc. ex Endl. Syn. Conif.* p. 166; *Parlat. in DC. Prodr.* vol. xvi. p. 398; *Kent in Veitch Manual of the Coniferae*, p. 316; *Mast. in Gard. Chron.* 1882, vol. xviii. p. 8, fig. 1–2; *Journ. Linn. Soc. Bot.* vol. xxxv. p. 590; affinis *P. Gerardianae*, Wall., sed foliis saepe paulo crassioribus brevioribusque et amentis in spicam terminalem nec infra apicem ramorum dispositis differt.

Arbor 17–30 m. alta, pyramidalis vel ovoidea, inferne saepe in ramos erectos vel ascendentes divisa, juvenilis cortice fusco griseo-variegato, adulta cortice albido squamis latis caducis denudato. *Ramuli* viridi-brunnei, laeves. *Folia* terna, rigida, 5–10 cm. longa, 1·75 mm. lata, facie carinata, dorso convexa, marginibus minute serrulata, atro-viridia, subnitida; fasciculi interdum subverticillatim approximati, basi primum squamis lanceolatis acutis deciduis 7–14 mm. longis membranaceis brunneis vestiti. *Amenta mascula* plurima, 5–7 mm. longa, in spicam compositam bracteatam terminalem 2–6 cm. longam conferta; bracteae 7–9 mm. longae, late-ovatae, cuspidato-acuminatae, apice recurvae, submembranaceae, pallide brunneae, nitidae. *Strobilus* maturus 4–5 cm. longus, 3·5–4 cm. diametro, conico-ovoideus; squamae obovatae, apice transverse rhomboideo-incrassatae, transverse carinatae et breviter recurvo-mucronatae. *Semina* immatura ala parva munita, matura exalata, 8 mm. longa, 7 mm. lata, compresso-ellipsoidea vel suborbiculata, pallide brunnea.—N. E. BROWN.

Pinus Bungeana is a very distinct species readily recognised in old examples by its white flaking bark; when young, however, the bark is dark smoky-brown with dull greyish patches where it has flaked off. It is specifically most nearly allied to *P. Gerardiana*, Wall., from which it is distinguished by its whiter bark, rather shorter and somewhat stouter leaves, and male catkins that form a compound terminal spike instead of being clustered below the apex of the branchlets. These two species, with *P. chihuahuana*, Engelm., and *P. Lumholtzii*, Robins. & Fern., form a small group which the late Dr. Masters looked upon as distinct from the other species of the genus owing to the deciduous leaf-scales and the leaves in bundles of 3 with minutely serrulate margins.

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Cultivation.—The Pines at Kew as a whole succeed better and resist the evil influences of London smoke and fog more successfully than the majority of Conifers do, and *P. Bungeana*, which has long been in cultivation, is no exception to this rule. This species grows very well in the ordinary gravelly soil characteristic of that part of the Pinetum in which it is planted. At Kew the trees assume in habit two distinct forms; an erect pyramidal form and a rounded bushy one. The figure here given was prepared from a tree of the former type, which is now 25 ft. high, with a trunk 23 inches in girth at 3 ft. from the ground. The trunk is covered with a smooth bark which peels off very much after the manner of the common Plane. A distinct and striking tree, *P. Bungeana* is also attractive from the deep vivid green of its foliage.

Description.—*Tree*, 60–100 ft. high; crown pyramidal or ovoid; stem often dividing low down into erect or ascending branches; young bark tawny with grey patches, old bark whitish flaking; young branches greenish-brown, smooth. *Leaves* in threes, rigid, 2–4 in. long, $\frac{1}{16}$ in. wide, keeled below, convex above, with finely serrate margins, dark green and somewhat shining; fascicles at times subverticillate, their bases clothed at first with lanceolate, acute, brown, membranous deciduous scales $\frac{1}{4}$–$\frac{1}{2}$ in. long. *Male catkins* numerous, $\frac{1}{5}$–$\frac{1}{4}$ in. long, aggregated in compound, bracteate, terminal spikes $\frac{3}{4}$–$2\frac{1}{4}$ in. long; bracts $\frac{1}{4}$–$\frac{1}{3}$ in. long, wide ovate, cuspidately acuminate and recurved at the tips, pale brown, shining, submembranous. *Cone* when mature $1\frac{1}{2}$–2 in. long, $1\frac{1}{4}$–$1\frac{1}{2}$ in. across, ovoid-conical; scales obovate, transversely rhomboidly thickened at the tips, transversely keeled and shortly reflexed mucronate. *Seeds* when young slightly winged; when ripe wingless, $\frac{1}{3}$ in. long, $\frac{1}{4}$ in. wide, compressed, ellipsoid or almost orbicular, pale brown.

Fig. 1, section of a leaf; 2, stamen; 3 and 4, female bract with scale; 5, cone; 6 and 7, female bract with scale, in fruiting stage; 8, seed:—*all enlarged except fig. 5, which is of natural size.*

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TAB. 8241.

SORBUS VILMORINI.

China.

ROSACEAE. Tribe POMEAE.

SORBUS, *Linn.*; *Schneider, Ill. Handb. Laubholzk.* 1904, vol. i. p. 667.

Sorbus (Aucuparia) Vilmorini, *Schneider in Bull. Herb. Boiss.* 1906, sér. 2, vol. vi. p. 317; affinis *S. microphyllae,* Decne, sed foliolis supra medium serratis, floribusque minoribus differt.

Arbor parva, circiter 3–5 m. alta. *Rami* striati, glabri vel leviter ferrugineo-hirtelli. *Gemmae* ovatae, acuminatae, apice plus minusve hirtellae. *Folia* gracilia, imparipinnata, rhachi leviter alata subglabra; foliola 9–14-juga, opposita vel subalterna, oblongo-elliptica, apice apiculata, 1·5–2 cm. longa, 5–7 mm. lata, supra medium acute serrata, utrinque glabra, laxe reticulata; stipulae subulatae, circiter 5 mm. longae. *Inflorescentiae* pauciflorae, ferrugineo-hirtellae. *Flores* parvi, circiter 6 mm. diametro. *Receptaculum* hirtellum. *Sepala* subglabra, triangularia, obtusa, 1·5 mm. longa. *Petala* obovata, breviter unguiculata, 3 mm. longa, 2 mm. lata. *Stamina* circiter 20. *Styli* 3, obtusi, subglabri. *Fructus* globosus, ruber, circiter 8 mm. diametro.—*Cormus foliolosa,* Franch. in Vilm. Frutic. Cat. prim. 1904–5, p. 102 (non Spach).—J. HUTCHINSON.

The plant from which our figure was prepared was presented to Kew in the autumn of 1905 by Mr. M. L. de Vilmorin, in whose collection of shrubs at Les Barres the original specimen is now a wide-spreading bush or small tree about 10 ft. in height. *S. Vilmorini* is very distinct from the other species of the genus now in cultivation and is certainly one of the most elegant. It is a native of Szechuan and Yunnan in South-western China, whence specimens, collected on the summit of Mount Omei, were sent to Kew by the Rev. E. Faber in 1887; others from the same locality were communicated by Mr. A. Henry a few years later, and still others from near Tachienlu were received from Mr. A. E. Pratt.

Schneider has enumerated thirty-four species of *Sorbus* as now in cultivation, seventeen of these being members of the section *Aucuparia.* He recognises two varieties of *S. Vilmorini,* a typical variety to which the plant here figured belongs, and a variety, var. *setschwanensis,* with smaller and more numerous leaflets, which approaches so closely to *S. microphylla* (*Pyrus microphylla*, Wall.), a native of Sikkim, that it might readily be regarded as a geographical form of that species.

Cultivation.—The Kew plant of *S. Vilmorini*, now a bush about 6 ft. in height, has grown well in a border of loamy soil. It forms a most attractive object in early June when the elegant pinnate foliage is at its best and every shoot bears a terminal corymb of pretty white flowers. The fruit is in good colour by September, and the seeds should afford a ready means of propagating what is one of the most attractive of the new shrubs received from China in recent years.

Description.—*Shrub* or small tree, 10–20 ft. high; branches striate, glabrous or sparingly rusty-pubescent; buds ovate, acuminate, with somewhat pubescent tips. *Leaves* slender, unequally pinnate, rhachis slightly winged, nearly glabrous; leaflets in 9–14 pairs, opposite or subalternate, oblong-elliptic, apiculate, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, $\frac{1}{5}$–$\frac{1}{4}$ in. wide, sharply toothed beyond the middle, glabrous above and below, wide-reticulate; stipules subulate, about $\frac{1}{5}$ in. long. *Inflorescence* few-flowered, rusty-pubescent. *Flowers* small, about $\frac{1}{4}$ in. across; receptacle pubescent. *Sepals* almost glabrous, triangular, obtuse, $\frac{1}{16}$ in. long. *Petals* obovate, short-clawed, $\frac{1}{8}$ in. long, $\frac{1}{12}$ in. wide. *Stamens* about 20. *Styles* 3, obtuse, almost glabrous. *Fruit* globose, red, about $\frac{1}{3}$ in. across.

Fig. 1, flower-bud; 2, partial section of flower, the petals removed; 3 and 4, upper portion of filaments and anthers:—*all enlarged.*

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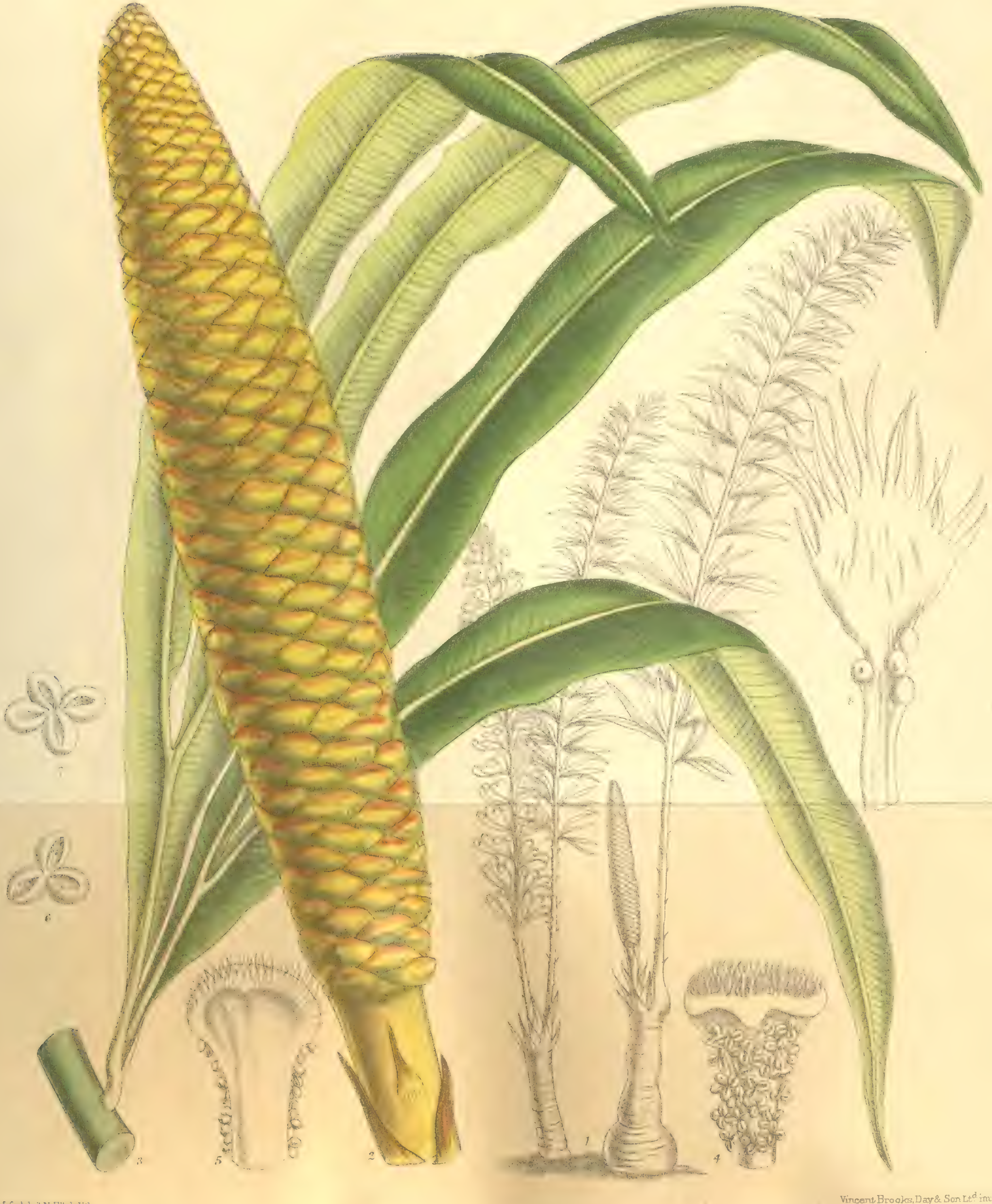

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TAB. 8242.

CYCAS MICHOLITZII.

Indo-China.

CYCADACEAE. Tribe **CYCADEAE.**

CYCAS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 445.

Cycas Micholitzii, *Dyer in Gard. Chron.* 1905, vol. xxxviii. p. 142, figs. 48, 49; foliis paucis pinnulisque subdichotomis in genere insignis.

Caudex nonnunquam subterraneus 20–60 cm. longus, 4–5 cm. vel imo basi 10–12 cm. crassus. *Folia* 2–3, 2–3-metralia, parte basali metrali 1·5 cm. lata aculeis brevibus latioribus armata, sursum pinnulis inter se 4 cm. remotis 20 cm. longis subdichotomis segmentis 2–2·5 cm. latis saepissime iterum divisis induta. *Strobilus* masculus breve pedunculatus, pedunculo 3 cm. longo 1·5 cm. crasso, subcylindricus, 15–18 cm. longus, 4 cm. crassus, squamis subspathulatis glabris flavis margine aurantiacis 1 cm. longis, apice brevissime apiculatis 8 mm. latis. *Carpophylli* basi aurantiaci, 8 cm. longi, lamina terminalis viridis obovato-rhombea, 3 cm. lata, superne profunde pectinato-lacera.—D. PRAIN.

Cycas Micholitzii was discovered in Annam by Mr. W. Micholitz, when collecting on behalf of Messrs. Sander & Sons. A plant sent home by him in 1904, and a complete series of herbarium specimens were placed at the disposal of Sir W. T. Thiselton-Dyer, whose formal description of the species was published in the following year. Complete material had also been communicated to Mr. H. N. Ridley, Director of the Botanic Gardens, Singapore; this, along with the drawings made under Mr. Ridley's supervision, which were published with the original diagnosis, was also made use of by Sir William in his study of the species. The most remarkable feature of the plant is the repeated dichotomy of the pinnules, a character which, however, is met with in an imperfectly known *Cycas* from China, so nearly allied to *C. Micholitzii* that the two may prove to be forms of the same species. *C. Micholitzii* is a member of a small group, confined to an area which extends from Nepal to Annam, in which the margins of the carpophylls are pectinate. The original plants were described by Mr. Micholitz as having the stem

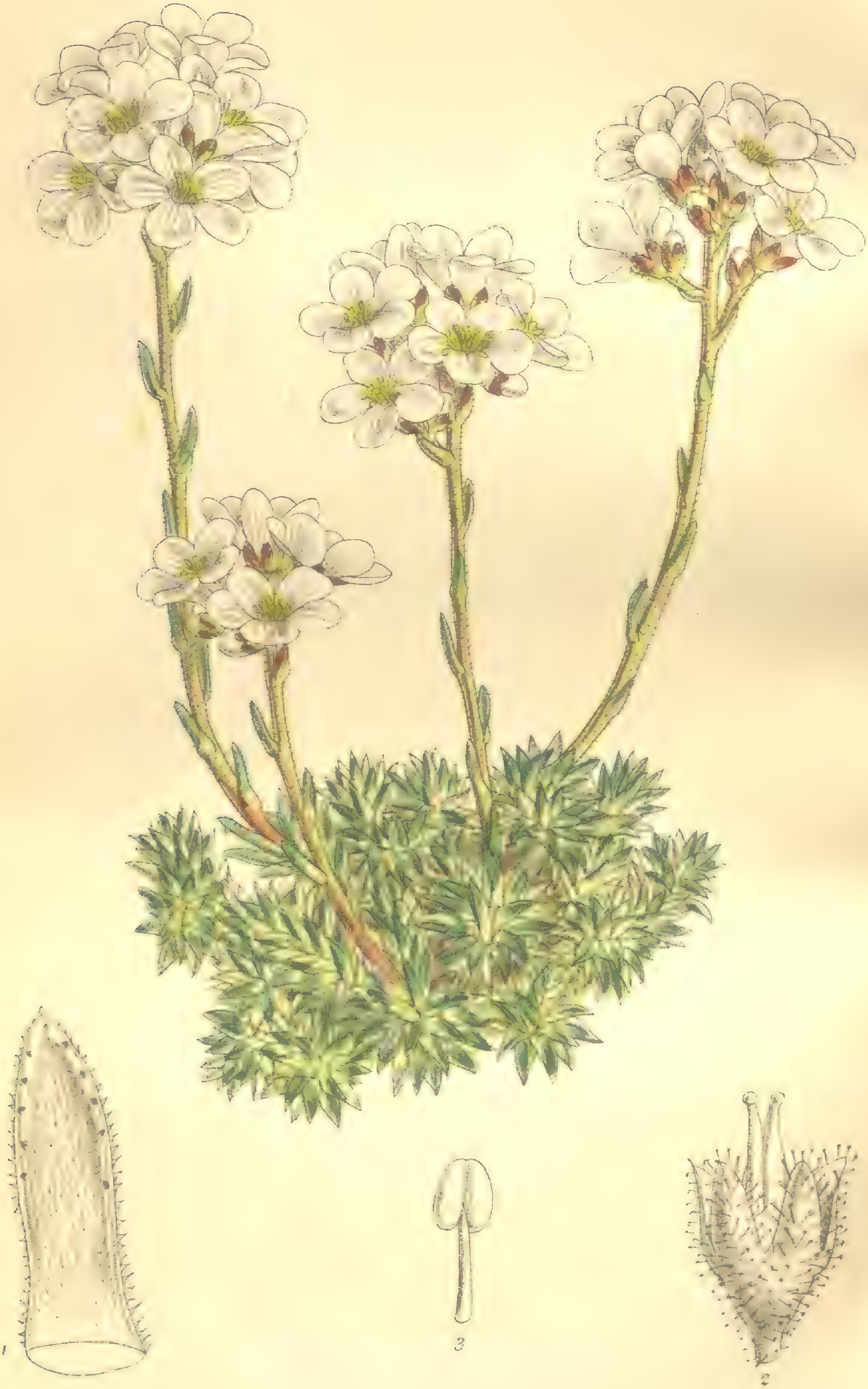
subterranean, but the imported stems now in cultivation at Kew, and shown in plate 8242, are similar in habit to those of other species of *Cycas* except in being more slender and in having usually a decidedly thickened base.

Cultivation.—At Kew this species is not unlike *C. pectinata* in behaviour, the leaves being practically annual. It would appear therefore that the conditions most favourable for its healthy growth are a liberal allowance of root-room, a good loamy soil, a plentiful supply of water whilst the leaves are being formed, and a tropical temperature with abundant sunlight. In winter the soil about the roots should be kept drier.

Description.—Stem sometimes subterranean, 8 in.–2 ft. in height, 1½ in. thick above, sometimes 4 in. thick at the base. *Leaves* 2–3, terminal, erect, 8–10 ft. long, their lower third beset with short rather flat yellow spines, elsewhere bearing two rows of subdichotomous pinnules 8 in. long and 1½ in. apart, their segments green above, paler beneath, ¾–1 in. wide, usually again divided. *Male cone* narrow-cylindric, on peduncles 1 in. long with a few narrow triangular acute bracts, the cones 6–7 in. long, 1½ in. thick, with yellow glabrous subspathulate scales, orange at margin, ⅓ in. long, ¼ in. wide at the shortly apiculate apex. *Carpophylls* 3 in. long, with narrower yellow base and obovate-rhomboid green terminal limb 1¼ in. wide, deeply pectinately fringed.

Fig. 1, sketches of two entire plants; 2, male cone; 3, portion of leaf showing an entire pinnule; 4, 5, scales from male cone; 6, 7, anthers; 8, carpophyll:—1 *much reduced, 4–8 enlarged.*

8243



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TAB. 8243.

SAXIFRAGA SCARDICA.

Balkan Peninsula.

SAXIFRAGACEAE. Tribe SAXIFRAGEAE.

SAXIFRAGA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 635.

Saxifraga scardica, *Griseb. Spicil. Fl. Rumel.* vol. i. p. 332; *Engl. Monogr. Saxifraga,* p. 261; affinis *S. Rochelianae,* Sternb., a qua foliis acutis recedit.

Herba caespitosa caudiculis dense foliatis. *Folia* inferiora patula, oblonga, acuta, 6–10 mm. longa, 2·5–3 mm. lata, rigida, supra leviter concava, subtus convexa in sicco carinata, margine cartilagineo in planta culta inferne ciliato superne serrulato, foveis intramarginalibus 9–15. *Caules floriferi* erecti vel ascendentes, 7–11 cm. longi, 3–11-flori, glanduloso-pilosi, rubro-tincti, floribus corymbosis; folia caulina sparsa, anguste oblonga, acuta, 6–7 mm. longa, 1·5 mm. lata, glanduloso-ciliata praeter partem tertiam vel quartam superam. *Calyx* extus glanduloso-pilosus; lobi ovati, acutiusculi, circiter 3 mm. longi. *Petala* oblanceolata, 5-nervia, vix 1 cm. longa, 4 mm. lata. *Stamina* longiora stylos aequantia.—T. A. SPRAGUE.

In 1905 (B. M. t. 8058) a figure was given of the form of *S. scardica* that is most usually met with in alpine gardens. This figure was accompanied by a description applicable to the species as a whole, and it was pointed out by Mr. Sprague that the form there figured is not the typical state of the species. It did not then, however, appear desirable to press the point, or to suggest the recognition in the plant figured at t. 8058 of a new variety, more especially as Halacsy had recently (Consp. Fl. Graec. vol. i. 1901, p. 598) interpreted the species in a very wide sense.

To Mr. R. Farrer, of Ingleborough, English horticulture is we understand indebted for the introduction of the rare typical *S. scardica*, a living plant of which was presented to Kew in 1908 by Mr. E. H. Jenkins of Hampton Hill. When this plant was grown alongside the form figured in 1905 it was evident that the latter is well entitled to the rank of a variety. The differences exhibited by the two forms may be briefly stated. In *S. scardica* proper, here figured, the lower

leaves are acute, with 9–15 intramarginal pits; the 3–11-flowered stems are reddish, and the reddish, subacute calyx-lobes are distinctly glandular-pilose. In the form figured at t. 8058, for which Mr. Sprague proposes the name *S. scardica*, var. *obtusa*, the lower leaves are subacute, with 5–11 intramarginal pits; the 1–3-flowered stems are green, and the green, obtuse calyx-lobes are relatively free from pubescence.

CULTIVATION.—Like its variety *obtusa*, the typical *S. scardica* is quite hardy at Kew, and has flowered freely, standing a moist atmosphere better than some of the Saxifragas of similar habit which are grown under the conditions that prevail in the Rock Garden.

DESCRIPTION.—*Herb*, densely tufted. *Leaves* below spreading, oblong, acute, $\frac{1}{4}$–$\frac{2}{3}$ in. long, $\frac{1}{10}$–$\frac{1}{8}$ in. wide, rigid, somewhat concave above, convex and when dry keeled below, with cartilaginous edges ciliate towards base and serrulate upwards, submarginal pits 9–15. *Stems* bearing flowers erect or ascending, 3–4$\frac{1}{2}$ in. long, corymbosely 3–11-flowered, glandular-hairy, reddish; leaves scattered, narrow-oblong, acute, about $\frac{1}{4}$ in. long, $\frac{1}{12}$ in. wide, glandular ciliate except towards apex. *Calyx* glandular-hairy outside; lobes ovate, subacute, about $\frac{1}{8}$ in. long. *Petals* oblanceolate, 5-nerved, about $\frac{2}{5}$ in. long, $\frac{1}{6}$ in. wide. *Stamens* with longish filaments, anthers almost level with stigmas.

Fig. 1, leaf; 2, calyx and pistil; 3, stamen: – *all enlarged.*

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TAB. 8244.

PSEUDERANTHEMUM SETICALYX.

Tropical Africa.

ACANTHACEAE. Tribe JUSTICIEAE.

PSEUDERANTHEMUM, *Radlk.*; *Lindau in Engl. & Prantl, Nat. Pflanzenfam.* vol. iv. pars iii. B, p. 330.

Pseuderanthemum seticalyx, *Stapf*; species *P. subviscoso*, Stapf (*Eranthemo subviscoso*, C. B. Clarke) arcte affinis, sed ab eo indumento inflorescentiae, calycis segmentis subulatis longe attenuatis, capsulisque majoribus distincta.

Suffrutex erectus, laxe ramosus, sparse vel superne densius pilis albis rigidulis hirsutiusculus, ramis teretibus. *Folia* ovata, acuminata, basi breviter contracta et anguste cuneatim decurrentia, 5–12 cm. longa, 3·5–9 cm. lata, tenuia, saturate viridia, pilis plerumque persparsis, nervis lateralibus utrinque 6–7 obliquis; petiolus gracilis 1·5–4 cm. longus. *Inflorescentiae* spiciformes in ramis terminales vel nonnullae ex axillis foliorum superiorum additae, ineunte anthesi plerumque densae, mox elongatae et inferne interruptae, demum ad 10 cm. longae, juniores apice ob bracteas calycumque segmenta subulata longa attenuata breviter comosae; rhachis magis minusve hirsutiuscula; cymae 3–1-florae, sessiles; pedicelli crassiusculi, breves vel obsoleti; bracteae subulatae, 5–6 mm. longae, parce albo-pilosulae; bracteolae bracteis similes nisi breviores. *Calyx* 5–6 mm. longus, glaber vel glabriusculus, profunde 5-fidus, segmentis subulatis longe tenuiter attenuatis. *Corolla* hypocrateriformis; tubus angustus, subrectus, pallide ruber, parce minute glanduloso-pilosus; limbus superne cinnabarinus, subtus pallidior, 2·5 cm. diametro, segmentis oblongis vel obovato-oblongis obtusis 4–5 mm. latis. *Antherae* breviter exsertae; filamenta ad 2·5 mm. longa. *Capsula* glabra, clavata, 2·5–3·8 cm. longa, superne 7–8 mm. lata, stipite angusto 1·3–2·3 cm. longo, parte seminifera a latere compressa inter semina leviter constricta. *Semina* lenticularia, 6–8 mm. longa, juxta basin dente aucta, uno latere laevia, altero corrugata, circumcirca obtuse marginata.—*Eranthemum seticalyx*, C. B. Clarke in Dyer, Fl. Trop. Afr. vol. v. p. 172.—O. STAPF.

Pseuderanthemum seticalyx, the species now figured, is a native of Nyasaland where it was first discovered by Dr. (now Sir J.) Kirk fifty years ago. The specific name has reference to the attenuate calyx-lobes, not to the presence of setae, for the calyx is glabrous or nearly so. For seeds of this species Kew is indebted to Mr. J. M. Purves, who obtained them on the Fuchila Plateau, Mlangi, British Central Africa, at an altitude of 6,000 ft., in 1904; the resulting plants flowered in March, 1905.

MARCH, 1909.

An explanation of the nomenclature and systematic position of the genera *Eranthemum* and *Pseuderanthemum* has already been given in this work (B. M. t. 8239). The genus *Pseuderanthemum* comprises between 60 and 70 species, inhabiting the tropics of both hemispheres; they are most numerous in the Indo-Malayan and Polynesian regions. The genus is very homogeneous, and the species much resemble each other in general appearance.

CULTIVATION.—The treatment most suitable for a large number of subtropical *Acanthaceae* answers well for the species here described. Cuttings are put in early in spring; the plants are grown on under liberal treatment, and the growths are stopped as often as is necessary to make them bushy. Plenty of sunshine and moisture must be allowed while growth is being made. Many of the species of *Pseuderanthemum* may be grown so as to get them in flower in winter, when they are of considerable decorative value. Among those best suited to this purpose are *P. albiflorum*, Radlk. (B. M. t. 4225); *P. Andersonii*, Lindau (B. M. t. 5571); *P. cinnabarinum*, Radlk. (B. M. t. 5921); *P. igneum*, Stapf (*Eranthemum igneum*, Linden); and the species now figured, which last may also be grown so as to flower in late summer.

DESCRIPTION.—*Undershrub*, erect, lax, somewhat hirsute with stiffish white hairs; branches terete. *Leaves* ovate, acuminate, base contracted and cuneately decurrent, 2–5 in. long, 1½–3½ in. wide, thin, dark green, sparingly hairy, main nerves oblique, 6–7-paired; petiole slender, ⅔–1½ in. long. *Inflorescences* spiked, terminal or also in upper leaf-axils, at first dense, afterwards elongating and interrupted below, ultimately 4 in. long, when young comose from the slender calyx-lobes and bracts; rhachis somewhat hirsute; cymes 3–1-flowered, sessile; pedicels rather thick and short or obsolete; bracts subulate, sparingly whitish hirsute, ¼ in. long, bracteoles similar but smaller. *Calyx* ¼ in. long, glabrous or nearly so, deeply 5-lobed, lobes slender subulate. *Corolla* salver-shaped; tube narrow, nearly straight, pale red, sparingly glandular hairy; limb cinnabar red above, paler beneath, 1 in. across; lobes oblong or subobovate obtuse nearly ¼ in. wide. *Anthers* slightly exserted; filaments $\frac{1}{10}$ in. long. *Capsule* glabrous, clavate, 1–1$\frac{1}{2}$ in. long, about $\frac{1}{3}$ in. wide above, with a narrow stipe $\frac{1}{2}$–$\frac{5}{6}$ in. long; fertile portion laterally compressed and somewhat constricted between the seeds. *Seeds* lenticular, $\frac{1}{4}$–$\frac{1}{3}$ in. long, toothed near the base, smooth on one side, corrugated on the other, with a blunt margin.

Fig. 1, bracteole, calyx and style; 2, section of calyx, showing ovary and base of style; 3, part of corolla laid open, showing stamens; 4, anther; 5, stigma:—*all enlarged.*

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TAB. 8245.

NIGELLA INTEGRIFOLIA.

Turkestan.

RANUNCULACEAE. Tribe HELLEBOREAE.

NIGELLA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 8.

Nigella integrifolia, *Regel in Enum. Pl. Semenov. Suppl.* 2, p. 10; *Bull. Soc. Nat. Mosc.* vol. xliii. 1870, p. 246; *Aitch. in Trans. Linn. Soc. Bot.* sér. 2, vol. iii. p. 30, t. 2; *Fedtschenko in Centralbl. Beih.* vol. xviii. 2, 1905, p. 212; *Hemsl. in Gard. Chron.* 1908, vol. xliv. p. 226; species ab omnibus hucusque cognitis floribus campanulatis insigniter recedens.

Herba gracilis, annua, primum obscurissime puberula, in statu sylvestri erecta, pauciramosa, vix ultra 30 cm. alta; in hortis major caulibus multiramosis 45–60 cm. longis gracilibus debilioribus plus minusve vagantibus et tortuosis. *Folia* subbasalia lineari-spathulata, integerrima, ad 10 cm. usque vel ultra longa; caulina inferiora linearia, indivisa, acuta, intermedia superioraque subsessilia, palmatim 3–9-partita, segmentis perangustis, acutissimis, saepius 3–5 cm. longis; summa involucrum formantia flores singulares includentia. *Flores* coerulei, campanulati, circiter 2–2·5 cm. longi. *Sepala* saepius 5, petaloidea, oblonga, marginibus arcte approximata, petala stamina et carpella includentia, apice rotundata, leviter recurva. *Petala* seu nectaria saepius 8, linearia, ad medium usque bifida, obscure ciliata, intus basi nectarifera. *Stamina* circa 20. *Carpella* saepius 3, circiter 1 cm. longa, ultra medium connata, breviter rostrata, rostris induratis divergentibus. *Semina* trigono-compressa, papilloso-rugosa, dorso tricostata, albida.—*N. diversifolia*, Franch. in Ann. Sc. Nat. sér. 6, vol. xv. 1883, p. 220, t. 10. *Komaroffia diversifolia*, O. Kuntze in Act. Hort. Petrop. vol. x. p. 144; Engl. & Prantl, Nat. Pflanzenfam. vol. iii. pars ii. p. 274; Ind. Kew. Suppl. i. p. 234 (sphalm. *divaricata*).—W. B. HEMSLEY.

Nigella integrifolia has been in cultivation at Kew since 1894 when seeds were received from the Imperial Botanic Gardens, St. Petersburg; specimens in flower were also received in July, 1907, from Mr. W. E. Gumbleton. Four of its congeners have already been figured in this work: *N. damascena*, Linn. (t. 22); *N. orientalis*, Linn. (t. 1264); *N. hispanica*, Linn. (t. 1265), and the inconspicuous *N. Garidella*, Spenn.; the last named appearing (t. 1266) under the name *Garidella Nigellastrum*, Linn. From these and all the other species of *Nigella* the plant now figured is readily distinguished by its bell-shaped flowers which strongly resemble those of a *Campanula*.

MARCH, 1909.

CULTIVATION.—*N. integrifolia* is grown as an annual and thrives quite as well as the elegant Love-in-a-Mist (*N. damascena*) or the Spanish Fennel-flower (*N. hispanica*) under the treatment suitable for these species. The seeds are sown under glass in early spring, and the young plants are transferred to the open border in May.

DESCRIPTION.—*Herb*, annual, slender, very sparingly puberulous; wild plants erect, little branched, rarely over 1 ft. high; cultivated examples more slender, weaker, somewhat spreading, much branched, 1½–2 ft. long. *Leaves* at base linear-spathulate, entire, 4 in. long or longer; lowest stem-leaves entire, linear, acute, the rest subsessile, 3–9-palmatipartite, lobes very narrow, very acute, usually 1¼–2 in. long, the uppermost involucrate round the solitary flowers. *Flowers* blue, campanulate, ¾–1 in. long. *Sepals* usually 5, petaloid, oblong, closely applied by their margins, tips rounded, slightly recurved. *Petals* or nectaries usually 8, linear, bifid half-way, obscurely ciliate, nectariferous at the base within. *Stamens* about 20. *Carpels* usually 3, about ⅖ in. long, connate above the middle, shortly beaked; beaks hardened, spreading. *Seeds* trigonously compressed, rugose, 3-ribbed behind, whitish.

Fig. 1, an upper-leaf; 2, a petal; 3, stamens; 4, pistil:—*all enlarged.*

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TAB. 8246.

RUBUS KOEHNEANUS.

Japan.

ROSACEAE. Tribe RUBEAE.

RUBUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 616; *Focke in Engl. & Prantl. Pflanzenfam.* vol. iii. pars iii. p. 28.

Rubus (Batothamnus) **Koehneanus,** *Focke in Späth Cat.* 1908–9, p. 123; a *R. inciso,* Thunb., foliis et floribus multo majoribus et sepalis duplo latioribus differt.

Frutex suberectus, circa 1 m. altus; rami iterum ramosi, striatuli, purpurei, pruinosi, laeves vel parce aculeati. *Folia* petiolata, simplicia, 3–5-loba vel interdum subintegra, crenata vel denticulata, 3–12 cm. longa, 2–12 cm. lata, basi saepissime profunde cordata lobis acutis vel subacutis, supra viridia, subtus albido-tomentosa, venis distincte reticulatis; petioli 1–8 cm. longi, parce aculeati. *Flores* ad apices ramorum laxe cormybosi, pauces; bracteae lineari-lanceolatae, acuminatae, 4–6 mm. longae; pedunculi graciles, laeves, 1–2 cm. longi. *Calyx* extra glaber, intus albido-tomentosus, segmentis late triangulari-ovatis acutis vel acuminatis 5–6 mm. longis, apice recurvis. *Petala* elliptico-oblonga vel obovata, obtusa, alba, circa 8 mm. longa. *Stamina* numerosa, incurva, in annulum disposita; filamenta glabra, 4 mm. longa, basi sanguinea, apice alba. *Carpella* glabra; styli 2 mm. longi, glabri; stigma capitatum. *Drupae* paucae, aurantiacae.—R. A. ROLFE.

The plant from which the figure now given has been prepared was purchased from Mr. Späth of Berlin in 1900 under the garden name of *R. moriifolius*; it differs, however, from Siebold's species so named, and Dr. Focke has found it necessary to treat it as a distinct species referable to a small East Asian group, the *Corchorifolii*, of the section *Batothamnus*. To the same group belong *R. corchorifolius*, Linn. f.; *R. crataegifolius*, Bunge; and *R. palmatus*, Thunb., which has already been figured in this work (B. M. t. 7801). It is considered by Dr. Focke to be most nearly allied to *R. incisus*, Thunb., from which it differs in its more robust habit and in the larger size of all its parts.

CULTIVATION.—*R. Koehneanus* at Kew has proved perfectly hardy and has formed a rounded bush 3 ft. high. It blossoms towards the end of May and its fruits are ripe in July. The plant thrives vigorously in a border of loamy soil, and can easily be increased by means of suckers. Its attractions as a shrub for the garden lie in its fine lobate leaves and in its abundant, pretty and distinct flowers.

DESCRIPTION.—*Shrub*, suberect, 3–4 ft. high; branches again branching, somewhat striate, with a purplish bloom, smooth or sparingly prickly. *Leaves* petioled, simple, 3–5-lobed or sometimes almost entire, crenate or toothed, $1\frac{1}{2}$–5 in. long, $\frac{3}{4}$–5 in. wide, base usually deeply cordate, the lobes acute or subacute; green above, white-pubescent beneath, distinctly reticulate; petioles $\frac{1}{3}$–3 in. long, sparingly prickly. *Flowers* few, in loose terminal corymbs; bracts linear-lanceolate, acuminate, $\frac{1}{6}$–$\frac{1}{4}$ in. long; peduncles slender, smooth, $\frac{2}{5}$–$\frac{3}{4}$ in. long. *Calyx* glabrous externally, white-pubescent within, its lobes wide triangular-ovate, acute or acuminate, $\frac{1}{5}$–$\frac{1}{4}$ in. long, their tips recurved. *Petals* elliptic-oblong or obovate, obtuse, white, about $\frac{1}{3}$ in. long. *Stamens* many, incurved, disposed in a circle; filaments glabrous, $\frac{1}{6}$ in. long, red below, white upwards. *Carpels* glabrous; styles $\frac{1}{12}$ in. long, glabrous; stigma capitate. *Drupes* few, orange.

Fig. 1, flower, petals removed: 2 and 3, stamens; 4, carpel:—*all enlarged.*

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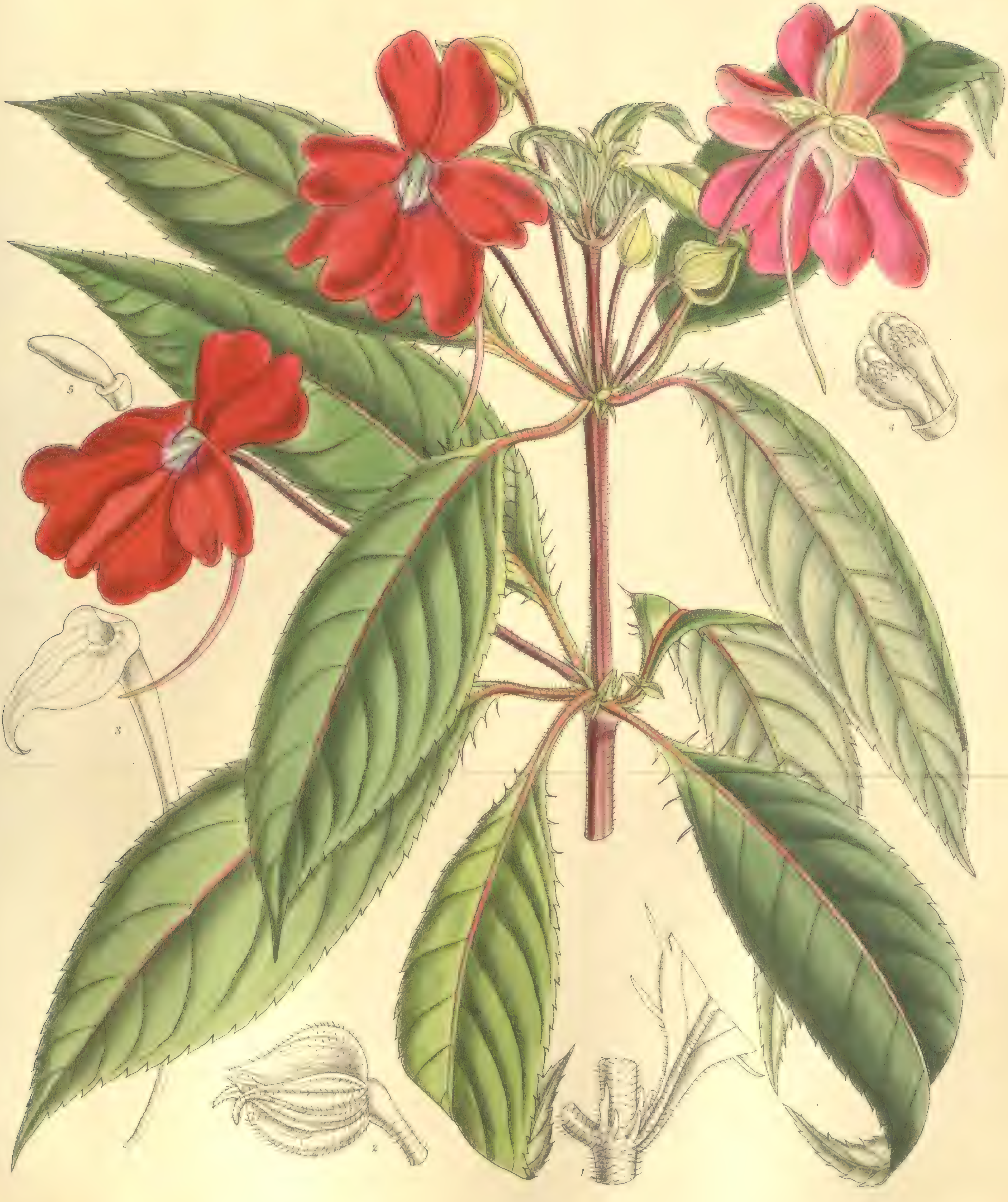

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TAB. 8247.

IMPATIENS HAWKERI.

Eastern New Guinea.

BALSAMINEAE.

IMPATIENS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 277.

Impatiens Hawkeri, *Bull, Cat.* 1886, p. 8, icon. p. 3; *Gard. Chron.* 1886, vol. xxv. p. 760, fig. 168; *Illust. Hort.* vol. xxxiv. 1887, p. 9, t. 2; herba elata, ramosa, grandiflora, foliis 3–5-natim verticillatis, inflorescentia simpliciter pedicellata, sepalis ovato-lanceolatis, labelli cymbiformis calcare elongato.

Herba 5–6 dm. alta, robusta, ramosa, grandiflora, partibus novellis exceptis glaberrima, ramis patentibus. *Folia* 10–15 cm. longa, inferiora opposita, superiora 3–5-natim verticillata, firma, ovato-oblonga, acuminata, argute serrulata, subtus pallida, basi acuta integerrima nuda vel ciliis elongatis paucis marginata, in petiolum robustum 2–3 cm. longum nudum angustata, nervis utrinque 8–10; glandulae interpetiolares paucae, crasse setaceae. *Flores* in axillis superioribus simpliciter pedicellati, solitarii, ampli, 6–8 cm. expansi, fulgide rubri; pedicelli 7–10 cm longi, ebracteati, robusti. *Sepala* 2, ovata vel ovato-lanceolata, 12–18 mm. longa, 5–7-nervia, viridia. *Verillum* obovato-rotundatum, apice retusum bilobum vel obcordatum, costa dorso carinata apiculata. *Alae* sessiles, 2–5 cm. longae; lobus basalis late oblongus, apice retusus vel obcordatus; distalis duplo major, late oblongus, apice bilobus; auricula rosalis 0. *Labelli* limbus ovatus vel ovato-lanceolatus, cymbiformis, aristatim acuminatus, 12–18 mm. longus; calcar 5–7 cm. longum, gracile, lente incurvum. *Filamenta* brevissima, superne incrassata et in connectivos antherarum confluentia; antherae orbiculares, introrsae. *Ovarium* rectum, obtusum.—J. D. HOOKER.

Impatiens Hawkeri is one of the only two species of *Balsamineae* hitherto discovered in New Guinea, the other being the closely allied *I. Herzogii*, K. Schum. (? = *I. cordipetala*, Zipp.). These are the most easterly members of the family in Asia, from which continent and its islands about 500 species are preserved in the principal European Herbaria. The most remarkable feature of these Asiatic species, Sir Joseph Hooker points out, is the very restricted geographical area to which they are confined. There are five such areas, each of great extent: the Himalayan; the Burmese, including Assam; the Western Indian Peninsular, including Ceylon; the Chinese; the Malayan, from Sumatra, Java and Borneo eastward to New Guinea and the Philippines. No two of these areas contain more than half-a-

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dozen species in common and one species alone, *I. Balsamina*, Linn., the origin of the garden Balsam, is a native of all. The plant now figured is a native of the last mentioned area, in which about 60 other species have been found; of these species *I. platypetala*, Lindl., from Java, is a typical member. Salient characters of these are the whorled leaves and simply pedicelled flowers met with in many of them, together with more or less obcordate standard and wing-lobes, a long spur and very short filaments with confluent, broad, nearly erect, introrse anthers.

I. Hawkeri was discovered by Lieut. Hawker, R.N. There is a specimen in the Kew Herbarium, which was received in November, 1884, from Dr. Schomburgk of the Adelaide Botanical Gardens—some two years prior to the earliest publication of the name—ticketed as from Lieut. Hawker and as native of one of the South Sea Islands, the name of which was forgotten. From this it appears that in all probability the plant was first raised in Adelaide and thence transmitted to Mr. Bull, of Chelsea, in whose catalogue it was included for the first time in 1886. A second herbarium specimen was communicated by Messrs. Veitch in 1897; it was collected by Mr. Burke. A third was sent from the Singapore Botanical Garden, ticketed as from "E. Brit. New Guinea, W. Micholitz, 1898." There is also a specimen in the British Museum Herbarium, collected by Mr. H. O. Forbes "near South Cape on the mainland."

In Mr. Bull's Catalogue *I. Hawkeri* was described as a handsome species of free growth and good habit, flowering in great profusion from March until October. For a time it enjoyed considerable popularity, but it suffered so frequently from attacks of the Begonia mite (*Tarsonymus*) that it went almost entirely out of cultivation. When in good health it grows vigorously, forming a shapely plant about 2 ft. high, well furnished with leaves and flowering freely and continuously during the summer. It requires tropical conditions with plenty of atmospheric moisture and shade from bright sunshine.

DESCRIPTION.—*Herb*, 1½–2 ft. high; stem stout, branches spreading, quite glabrous except on the young shoots. *Leaves* 4–6 in. long, opposite below, whorled above, firm, ovate-oblong, acuminate, sharply serrate, pale beneath, base cuneate, entire, naked or with a few marginal cilia and tapering to a petiole $\frac{3}{4}$–1 in. long; main-nerves 8–10 pairs; interpetiolar glands few, setaceous, stout. *Flowers* in the upper axils, large, simply pedicelled, solitary, $2\frac{1}{4}$–3 in. across, bright red; pedicels $2\frac{3}{4}$–4 in. long, stout; bracts 0. *Sepals* 2, ovate or ovate-lanceolate, $\frac{2}{3}$–1 in. long, 5–7-nerved, green. *Vexillum* rounded-obovate, tip retuse 2-lobed or obcordate, with an apiculate rib, keeled on the back. *Wings* sessile $\frac{3}{4}$–2 in. long; basal lobe wide oblong, retuse or obcordate; distal twice the size, wide oblong, 2-lobed. *Labellum* with limb ovate or ovate-lanceolate, cymbiform, sharply acuminate, $\frac{1}{2}$–$\frac{3}{4}$ in. long; spur 2–$2\frac{3}{4}$ in. long, slender, slightly curved. *Filaments* very short, thickened upwards and confluent in the connectives of the orbicular, introrse anthers. *Ovary* straight, obtuse.

Fig. 1, portion of branch with base of leaf and interpetiolar glands; 2, bud; 3, lip; 4, staminal column; 5, ovary:—*all enlarged.*

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Tab. 8248.

MICROLOMA TENUIFOLIUM.

South Africa.

ASCLEPIADACEAE.

Microloma, *R. Br.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 747.

Microloma tenuifolium, *K. Schum. in Engl. & Prantl, Pflanzenfam.* vol. iv. pars ii. p. 222; *N. E. Br. in Dyer, Fl. Cap.* vol. iv. sect. i. p. 550; species ob lobos corollae cordato-orbiculares etiamque ob fasciculos pilorum deflexorum in faucem corollae dispositos insignis.

Herba caule volubile gracile glabro. *Folia* opposita, patentia vel deflexa, breviter petiolata, 2·5–7 cm. longa, 1–3 mm. lata, linearia, acuta, saepe marginibus revolutis, glabra. *Cymae* ad nodos sublaterales, 3–7-florae. *Pedunculi* 4–6 mm. longi. *Pedicelli* 4–7 mm. longi, tenuiter adpresse puberuli. *Sepala* 5 mm. longa, lineari-lanceolata vel oblongo-lanceolata, acuta, tenuiter puberula vel subglabra. *Corolla* urceolata, subcarnosa, extra glabra, intra ad faucem fasciculis pilorum deflexorum 5 onusta, kermesina; tubus 5 mm. longus, pentagonus, inferne inflatus; lobi 2 mm. longi et lati, cordato-orbiculares, obtusissimi, imbricato-contorti. *Coronae* tuberculae parvae, ad medium corollae insertae. *Columnae staminum* ad medium 5 calcaratae. *Folliculi* solitarii, 5·5–7·5 cm. longi, 7–8 mm. crassi, fusiformes, longe acuminati, glabri. *Semina* 4 mm. longa, ovata, concavo-convexa, tuberculata, apice comosa.—*Microloma lineare*, R. Br. in Mem. Wern. Soc. vol. i. p. 53. *M. linearis* et *M. tenuiflora*, O. Kuntze in Jahrb. Bot. Gart. Berl. vol. iv. p. 268. *Periploca tenuifolia*, Linn. Sp. Pl. ed. i. p. 212. *Ceropegia tenuifolia*, Linn. Mant. ii. pp. 215, 346. *C. sinuata*, Poir. Encycl. Meth. Suppl. vol. ii. p. 178.—N. E. Brown.

The genus *Microloma*, which is endemic in South Africa, includes ten species, most of which are confined to the Central and Western Regions of Cape Colony. The leading exceptions are *M. sagittatum*, R. Br., which is common in the Coast Region as well as in the Western, and the species now figured, which appears to be confined to the Coast Region but is widely distributed therein from the Van Rhynsdorp to the Port Elizabeth Divisions. Mr. Brown points out that the only species with which *M. tenuifolium* might be confused is *M. namaquense*, Bolus, a species restricted to the Western Region, in which the deflexed tufts of hairs are situated near the middle of the corolla-tube. The remaining species have the corolla-lobes more or less laterally compressed, longer than broad and often dorsally gibbous.

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M. tenuifolium, the Coral Climber of South Africa, though it can be grown at Kew, never succeeds satisfactorily under the conditions that obtain here, and we are indebted to Mr. W. E. Gumbleton for the specimen now figured which was grown in his garden. In a note in the Gardeners' Chronicle for 1908, vol. xliii. p. 79, Mr. Gumbleton records the receipt of three healthy well-grown plants of this species from Port Elizabeth, where it is found growing wild at the base of low scrubby bushes round the branches of which it twines its slender, wire-like stems. The evidence to be obtained from herbarium specimens indicates that the wild plant flowers more profusely and bears more brightly coloured corollas than is the case in this country. These flowers, which are waxy and Hoya-like, are produced in axillary bunches. The plant requires greenhouse conditions.

Description.—*Herb*, stems twining, slender, glabrous. *Leaves* opposite, spreading or deflexed, short petioled, 1–$2\frac{3}{4}$ in. long, 1–$1\frac{1}{2}$ lin. wide, linear, acute, glabrous; margins often revolute. *Cymes* sublateral, 3–7-flowered; peduncles $\frac{1}{6}$–$\frac{1}{4}$ in. long; pedicels $\frac{1}{6}$–$\frac{1}{3}$ in. long, faintly adpressed-puberulous. *Sepals* $\frac{1}{5}$ in. long, linear or oblong-lanceolate, acute, faintly puberulous or nearly glabrous. *Corolla* urceolate, somewhat fleshy, crimson, glabrous outside, and with 5 tufts of deflexed hairs in the throat within; tube $\frac{1}{5}$ in. long, pentagonal, inflated below; lobes 1 lin., rounded-cordate, blunt, contorted-imbricate; corona-tubercles small, attached to middle of corolla-tube. *Staminal column* 5-spurred at the middle. *Follicles* solitary, $2\frac{1}{4}$–3 in. long, about $\frac{1}{3}$ in. thick, fusiform, long acuminate, glabrous. *Seeds* $\frac{1}{6}$ in. long, ovate, tubercled, concave on one side, very convex on the other, with comose tips.

Fig. 1, a flower; 2, corolla, laid open; 3, staminal column; 4 and 5, anthers:—*all enlarged.*

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TAB. 8249.

ARBUTUS MENZIESII.

Western North America.

ERICACEAE. Tribe ARBUTEAE.

ARBUTUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 581.

Arbutus Menziesii, *Pursh, Fl. Am. Sept.* vol. i. p. 282; *DC. Prodr.* vol. vii. p. 582; *Hook. Fl. Bor.-Am.* vol. ii. p. 36; *Hook. & Arn. Bot. Beechey's Voy.* p. 143; *Gray, Brewer & Wats. Bot. Calif.* vol. i. p. 452, *partim*; *Gray, Synop. Fl. N. Am.* vol. ii. p. 27, *partim*; *Sargent, Silva*, vol. v. p. 123, t. 231; *Elwes & Henry, Trees of Great Brit. & Ireland*, vol. iii. p. 565; species *A. Andrachne*, Linn., similis, sed foliis amplioribus subtus pallidioribus et connectivo antherarum loculos leviter superante differt.

Arbor 6–15, rarissime ultra 30 m. alta; truncus 0·3–1·25 interdum ad 2 m. diametro, omnino vel partim ut rami vetusti cortice deglubente deinde laevissimus, cinnamomeus; coma latissima; ramuli primo pallide rubri, virides vel aurantiaci, glabri vel interdum pilis conspersis cito evanescentibus vestiti. *Folia* elliptica vel oblonga, 7–13 cm. longa, 4–8 cm. lata, apice rotundata vel brevissime cuspidata, basi rotundata, subcordata vel cuneata, integerrima vel interdum (praecipue plantarum juvenilium) serrata, coriacea, supra saturate viridia, nitida, subtus glauca; petioli crassi, 1–2·25 cm. longi, supra canaliculati. *Flores* in paniculis erectis terminalibus puberulis 12–15 cm. longis latisque dispositi; pedicelli 4–5 mm. fructiferi ad 1 cm. longi, bracteis scariosis ovatis brevioribus subtendentes. *Calyx* albidus, parvus, scariosus, 5-lobatus. *Corolla* urceolata, alba, circiter 5 mm. longa. *Staminum* filamenta pilosa, basi dilatata; antherae recurve biaristatae, connectivo loculos leviter superante. *Ovarium* glabrum, 5-loculare, loculis pluriovulatis. *Fructus* drupaceus, granulatus, saepius subglobosus, lucide aurantiacus, ad 12 mm. longus. *A. procera*, Dougl. ex Lindl. Bot. Reg. vol. xxi. t. 1753; DC. Prodr. vol. vii. p. 582; Paxt. Mag. Bot. vol. ii. p. 147 cum tab. col. *A. laurifolia*, Hook. Fl. Bor.-Am. vol. ii. p. 36, non Lindl.—S. A. SKAN.

Under the name of *Arbutus procera* this handsome evergreen tree was introduced into this country by the Horticultural Society of London through their collector, David Douglas, in 1825. It appears never to have become common, and the specimens usually seen have not reached any considerable size. Mr. Elwes, however, records some fine trees known to him, the largest being that in the gardens of Mr. J. R. Anderson, at Bassetwood, near Southampton, which is 50 ft. high.

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The species, which bears the vernacular name of Madroña, is distributed from the British Columbia coast at Seymour Narrows southward through the coast region of Washington and Oregon, and through the California coast ranges to the Santa Lucia Mountains. Professor Sargent describes it as the noblest of all its race, and refers to a magnificent specimen growing on the slopes of Mount Tamalpais, near the town of San Rafael, Marin County, California, which is upwards of 100 ft. high and has a trunk measuring 23 ft. in girth at 3 ft. from the ground. An illustration of this is given in the Garden and Forest, vol. v. p. 151. South of the Bay of San Francisco *Arbutus Menziesii* is often shrubby. Its heavy, hard and close-grained wood is used in the making of furniture, and largely also in making charcoal for gunpowder.

Arbutus Menziesii is one of the few hardy Ericaceous plants which attain to tree-like dimensions in this country. The specimen from which the flowers figured in the accompanying plate were taken has stood for many years on the north side of the Broad Walk at Kew. It is now a spreading, bushy tree about 20 ft. high, with a short trunk 4 ft. 8 in. in girth. It has an interesting and conspicuous appearance because of its smooth cinnamon-coloured branches. The species is quite hardy at Kew, although the shoots of young seedlings, which grow vigorously and late into the autumn, are apt to be cut back by frost. Plants should be given a permanent place early, because of their impatience of disturbance at the root. Once established, they grow quickly. The soil should be of a peaty nature or, failing that, a sandy loam.

DESCRIPTION.—*Tree*, stem 20–50, rarely up to 110 ft. high, 1–4 or sometimes up to 7 ft. in diameter, bark generally or at least partly flaking as it also does on the larger branches, then very smooth and cinnamon-coloured; crown spreading; young twigs pale red, orange or green, smooth or sparsely clothed with hairs that soon disappear. *Leaves* elliptic or oblong, 2½–5 in. long, 1½–3 in. wide, apex rounded or shortly cuspidate, base rounded, subcordate or cuneate, entire or sometimes (especially in young specimens) serrate, coriaceous, dark green, shining above, glaucous beneath; petioles thick, channelled above, ⅓–1 in. long. *Flowers* in erect, terminal, puberulous panicles 5–6 in. across; pedicels $\frac{1}{6}$–$\frac{1}{5}$ in., in fruit $\frac{2}{5}$ in. long; bracts scarious, ovate, shorter than the pedicels. *Calyx* whitish, small, scarious, 5-lobed. *Corolla* white, urceolate, about $\frac{1}{5}$ in. long. *Filaments* pilose, dilated at the base; anthers recurved, biaristate, the connective rather longer than the anther-cells. *Ovary* glabrous, 2-celled; cells many-ovuled. *Fruit* drupe-like, granular, usually subglobose, bright orange, $\frac{1}{3}$–$\frac{1}{2}$ in. long.

Fig. 1, flower-bud; 2, flower; 3 and 4, anthers; 5, pistil:– *all enlarged.*

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[illegible]

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Tab. 8250.

STROPHANTHUS Preussii.

West Africa.

Apocynaceae. Tribe **Echitideae.**

Strophanthus, *DC.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 714.

Strophanthus Preussii, *Engl. & Pax in Engl. Jahrb.* vol. xv. p. 369; *Stapf in Dyer, Fl. Trop. Afr.* vol. iv. pars i. pp. 176, 605; *Gilg in Engl. Monogr. Afr. Pfl.* vii. *Strophanthus*, p. 24; affinis *S. Barteri*, Franch., sed sepalis exterioribus basi late ovatis et corollae colore distinctus.

Frutex scandens vel sarmentosus, ad 4 m. altus, ramis glabris brunnescentibus, albo-lenticellatis. *Folia* elliptica vel oblonga vel ovata vel obovata, abrupte acuminata, basi rotundata vel acuta, 5–10 cm. longa, 3·7–5 cm. lata, membranacea, glabra, venis secundariis utrinque 6–7. *Cymae* terminales, pedunculatae, plerumque multiflorae, corymbosae, minute puberulae; bracteae foliaceae, ovatae vel lanceolatae, obtusae vel acutae, basi angustatae, 8–16 mm. longae; pedicelli ad 1 cm. longi. *Calyx* foliaceus, 1·4–2 cm. longus; sepala exteriora e basi lata ovata linearia vel lineari-oblonga, interiora etiam basi angusta, glabra. *Corolla* minute pulverulenta, albo-lutescens vel pallide aurantiaca, tubo rubescente squamis faucialibus caudisque sanguineis, parte infrastaminali 1 cm. longa, suprastaminali campanulata 8–10 mm. longa, lobis ovatis abrupte caudatis, caudis filiformibus ad 30 cm. longis. *Antherae* 3 mm. longae, dorso tomentosae. *Ovarium* pilosum. *Folliculi* lanceolati, apice incrassati, 25 cm. longi, 3 cm. lati, fusci, lenticellis albidis elongatis notati. *Semina* ambitu elliptica, acuminata, 9–12 mm. longa, 3 mm. lata, fusco-pubescentia, coma stipiti nudo 5–8 mm. longo, axi plumosa, 15–20 mm. longa, pilis ad 5 cm. longis candidis.—O. Stapf.

Strophanthus Preussii is a species which extends from the Gold Coast to Angola and eastwards to the Middle Congo. It is closely allied to *S. Barteri*, Franch., from Lagos, but in that plant all the sepals are narrow and rather spathulate. It has been identified by Dr. Gilg with *S. bracteatus*, Franch., a species of which there is no authentic specimen at Kew. Dr. Stapf however explains that the description originally given of *S. bracteatus* points to that plant being distinct from *S. Preussii*. According to Franchet, *S. bracteatus* has glabrous inflorescences and white corollas streaked with red, while the tails of the corolla-lobes are only 10–12 cm. long. The figure here given has been made from a specimen which flowered in the tropical

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collection at Kew. The description now for the first time given of the follicles and seeds has been based on a specimen collected in Lagos and communicated to the Kew herbarium by Sir T. R. Fraser, Edinburgh.

Strophanthus Preussii is grown as a stout climber against the roof of the Palm House at Kew. It was raised from seeds forwarded in 1902 by Mr. W. H. Johnson, from the Botanic Station at Aburi, Gold Coast. It flowered for the first time in July, 1908. As a garden plant it is not so attractive as the South African *S. grandiflorus* (B. M. t. 7390) formerly treated as a variety of *S. Petersianus*, or as *S. gratus* (B. M. t. 4466) formerly known as *Roupellia grata*. These are all tropical climbers which grow freely when planted in a loamy soil and afforded ordinary tropical house treatment.

DESCRIPTION.—*Shrub*, climbing or straggling; stems up to 12 ft. long, branches glabrous, brownish with white lenticels. *Leaves* elliptic, oblong, ovate or obovate, sharply acuminate, base rounded or cuneate, 2–4 in. long, $1\frac{1}{2}$–2 in. wide, membranous, glabrous; secondary nerves 6–7 pairs. *Cymes* terminal, peduncled, usually corymbosely many-flowered, finely puberulous; bracts leafy, ovate or lanceolate, obtuse or acute, base cuneate, $\frac{1}{3}$–$\frac{2}{3}$ in. long; pedicels $\frac{2}{5}$ in. long. *Calyx* $\frac{1}{2}$–$\frac{3}{4}$ in. long; sepals leafy, the outer wide-based, ovate-linear or linear-oblong, the inner contracted at the base, glabrous. *Corolla* finely pulverulent, yellowish-white or pale orange, the tube reddish, the scales within the throat and the tails purple; infrastaminal portion under $\frac{1}{2}$ in. long, suprastaminal portion campanulate rather shorter, lobes ovate suddenly contracted into filiform tails up to 1 ft. in length. *Anthers* $\frac{1}{8}$ in. long, tomentose on the back. *Ovary* hairy. *Follicles* lanceolate with thickened tips, 10 in. long, $1\frac{1}{4}$ in. wide, tawny and marked with elongated white lenticels. *Seeds* elliptic, acuminate, $\frac{1}{3}$–$\frac{1}{2}$ in. long, $\frac{1}{8}$ in. wide, tawny-pubescent; coma with a naked stipe $\frac{1}{5}$–$\frac{1}{3}$ in. long and a plumose axis $\frac{3}{5}$–$\frac{4}{5}$ in. long; hairs of the coma $\frac{1}{5}$ in. long, white.

Fig. 1, section of calyx; 2, section of corolla-tube, showing anthers; 3, stigma:—*all enlarged.*

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TAB. 8251.

ANTHURIUM TRINERVE.

Brazil and Guiana.

ARACEAE.

ANTHURIUM, *Schott*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 998.

Anthurium trinerve, *Miq. in Linnaea*, vol. xvii. p. 66; *Schott, Prodr. Aroid.* p. 439; *Engler in DC. Monogr. Phanerog.* vol. ii. p. 109; species *A. violaceo*, Schott, valde affinis sed ovario apice conico exserto et baccis distincte apiculatis differt.

Herba, caulis erectus, radicans, 10–30 cm. altus, 6–10 mm. crassus, superne fibris cataphyllarum lanceolatarum decompositarum vestitus, internodiis 1–2 cm. longis. *Foliorum* petioli 2·5–10 cm. longi, subteretes, antice plani vel leviter canaliculati, basi brevissime vaginati, incrassati, apice geniculo 5–8 mm. longo instructi; lamina 11–17 cm. longa, 2·5–7 cm. lata, lanceolata, utrinque acuta, trinervia, supra atr viridia, impunctata, subtus pallidiora, minute punctata. *Pedunculi* solitarii, erecti, 3–9·5 cm. longi, 3 mm. crassi. *Spatha* erecta vel erecto-patens, 1·5–2 cm. longa, 1 cm. lata, ovata, acuta, viridis. *Spadix* sessilis, 1·5–5 cm. longus, basi 6–8 mm. crassus, superne leviter attenuatus, albus. *Flores* 2·5–3 mm. diametro; ovarium exsertum, apice conicum, 2-loculare, loculis 2–4-ovulatis. *Baccae* longe exsertae, 9–11 mm. longae, 5–7 mm. diametro, ellipsoideae, breviter apiculatae, pallide violaceae; semina 4–7.—*Anthurium brachyspathum*, K. Koch ex Schott, Prodr. Aroid. p. 439.—N. E. BROWN.

Anthurium trinerve is a native of Brazil and Guiana, in which countries it is not uncommon. It is very nearly allied to *A. violaceum*, Schott, but it usually has broader leaves than that species; the stem too is rather more robust and is more densely clothed with the fibrous remains of the cataphyllary leaves. The chief distinction, however, as Mr. Brown points out, is that the ovary in *A. trinerve* tapers into a conical style-like portion exserted far beyond the sepals; this feature is absent from *A. violaceum*. It is to be noted that the species here described must not be confounded with the similarly named *A. trinervium*, Kunth, a plant totally different in appearance, with much larger, cordate leaves. The plant from which the figure now given has been prepared has long been in cultivation at Kew; it flowers freely every year and fruits copiously, the flowers being evidently self-fertile.

APRIL, 1909.

From the cultural standpoint *A. trinerve* is interesting among the many species cultivated at Kew as being one of a group the members of which are attractive on account of the bright colour of their fruits. Foremost among these stands *A. Bakeri*, Hook. f., figured at plate 6261 of this work, which has bright crimson berries. Two members of the group, *A. violaceum*, Schott, alluded to above, and *A. margaritaceum*, Baker, agree with the species now figured in having lilac berries. The cultural requirements of the plant are those suitable for *A. Scherzerianum*, Schott (B. M. t. 5319), and a number of other well-known species that are grown as ornamental stove-plants.

Description.—*Herb*, stem erect, rooting, 4–12 in. high, $\frac{1}{4}$–$\frac{2}{5}$ in. thick, clothed upwards with the fibrous remains of lanceolate cataphyllary leaves; internodes $\frac{2}{5}$–$\frac{4}{5}$ in. long. *Leaves* distinctly petioled; petioles 1–4 in. long, subterete, flat or slightly channelled above, the base shortly sheathed and thickened, the apex with a geniculate swelling $\frac{1}{5}$–$\frac{1}{3}$ in. long; leaf-blade 4–7 in. long, 1–3 in. wide, lanceolate, acute, base cuneate, 3-nerved, dark green and uniform above, paler and finely punctate beneath. *Peduncles* solitary, erect, $1\frac{1}{4}$–$3\frac{1}{2}$ in. long, $\frac{1}{8}$ in. thick. *Spathe* erect or slightly spreading, $\frac{3}{5}$–$\frac{4}{5}$ in. long, $\frac{1}{5}$ in. wide, ovate, acute, green. *Spadix* sessile, $\frac{3}{5}$–2 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. thick at the base, slightly narrowed upwards, white. *Flowers* $\frac{1}{10}$–$\frac{1}{8}$ in. across; ovary exserted, with a conical apex, 2-locular, the cells 2–4-ovuled. *Berries* far exserted, $\frac{1}{3}$–$\frac{1}{2}$ in. long, $\frac{1}{5}$–$\frac{1}{4}$ in. across, ellipsoid, shortly apiculate, lilac, 4–7-seeded.

Fig. 1, flowers; 2, perianth-segment and stamen; 3, section of pistil; 4 and 5, ovaries in sections; 6, fruit; 7, seed:—*all enlarged.*

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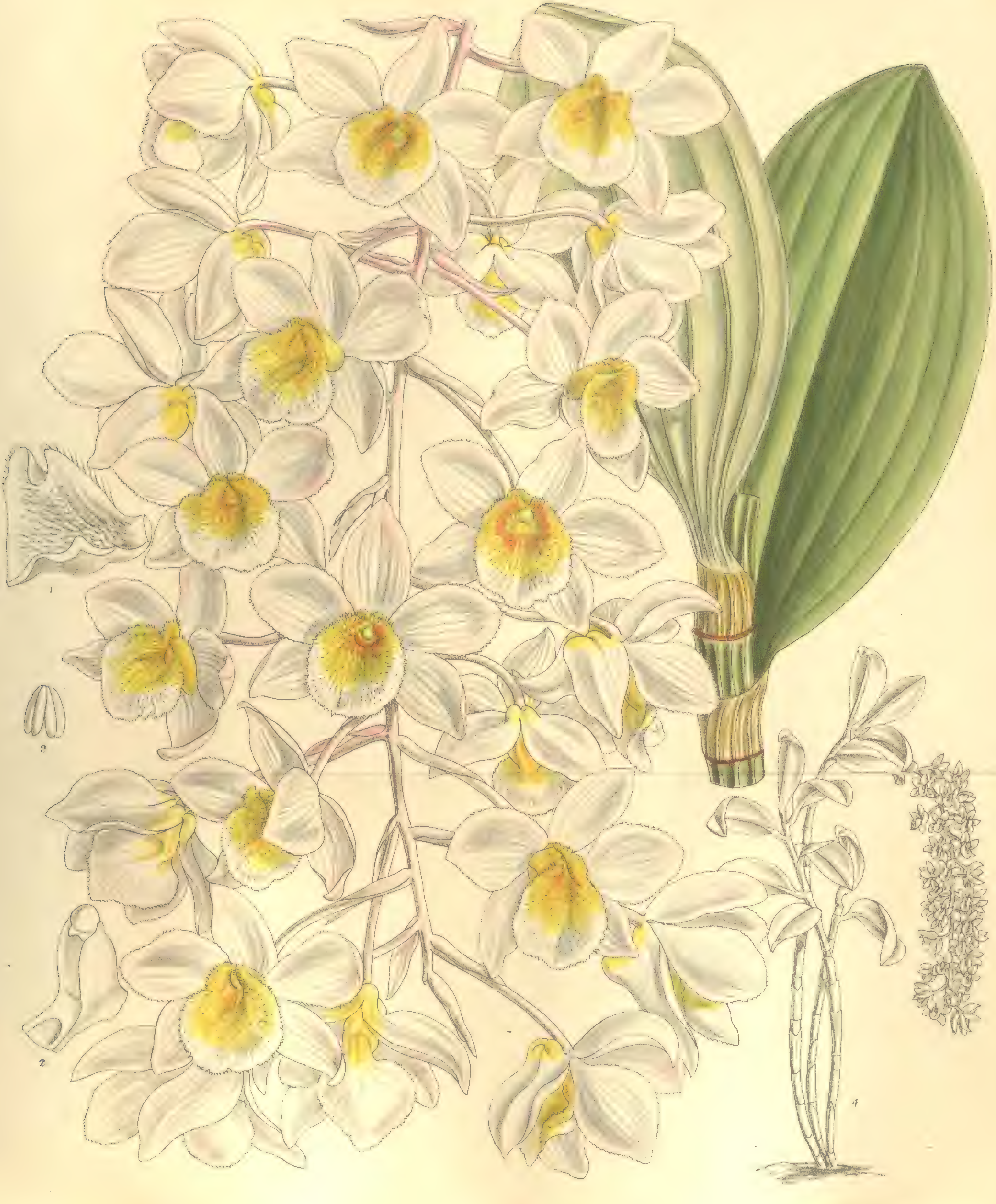

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TAB. 8252.

DENDROBIUM BRONCKARTII.

Indo-China.

ORCHIDACEAE. Tribe EPIDENDREAE.

DENDROBIUM, *Swartz*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 498.

Dendrobium Bronckartii, *Wildem. in Gard. Chron.* 1906, vol. xxxix. p. 380; *Rev. Hort. Belge*, 1907, p. 369, fig. 67 et ic. col.; a *D. thyrsifloro*, Reichb. f., racemis amplioribus et laxis, bracteis pedicellisque fere duplo longioribus, et floribus roseis differt.

Herba epiphytica, elata. *Caules* elongati, teretes, sulcati, foliosi, circa 60–90 cm. longi, vaginis membranaceis vestiti. *Folia* ovato-oblonga, subacuta, coriacea, 10–12 cm. longa, circa 4–7 cm. lata. *Racemi* axillares, penduli, circa 30 cm. longi, laxiflori, multiflori, basi vaginis tubulosis imbricatis vestiti; bracteae lineari-oblongae, obtusae, submembranaceae, 1·5–3 cm. longae; pedicelli graciles, 4–5 cm. longi. *Flores* speciosi, dilute rosei, labelli disco macula aurantiaca magna ornato. *Sepala* patentia, late elliptico-oblonga, obtusa, circa 2·5 cm. longa. *Petala* elliptico-ovata, obtusa, 2·5 cm. longa. *Labellum* breviter unguiculatum, suborbiculare, obtusissimum, 2·3 cm. longum, margine minute denticulato, disco velutino, lobis lateralibus involutis. *Columna* oblonga, lata.—R. A. ROLFE.

A recent addition to the genus, *D. Bronckartii* is most closely allied to the familiar *D. thyrsiflorum*, Reichb. f., but is readily distinguished by its larger size, its ampler and laxer inflorescence and its light rose-coloured flowers. The species was introduced from the mountains of Annam in Indo-China by the collector whose name it bears, and the plant from which the drawing now given has been made was purchased in 1906 from Mr. Verdonck of Ghent.

Its general resemblance and evident affinity to *D. thyrsiflorum* had led to its cultivation under the conditions suitable for that species; abundance of heat and moisture, with very little shade during summer when the plants were in growth, an intermediate temperature with very little moisture from October until the flower-buds showed signs of activity, when a good soaking at the root and tropical conditions were again afforded. Like *D. thyrsiflorum*, *D. densiflorum*, *D. Farmeri* and the other members of the same group, this species is remarkable for its large, handsome flowers disposed

MAY, 1909.

in decurved racemes. It is a striking addition to the group, and as, like the other members, it is not difficult to grow, it ought to share their popularity as garden orchids.

DESCRIPTION.—*Herb*, epiphytic. *Stems* long, terete, channelled, leafy, 2–3 ft. long, clothed with membranous sheaths. *Leaves* ovate-oblong, subacute, coriaceous, 4–5 in. long, 1½–2½ in. wide. *Racemes* lax, axillary, pendulous, many-flowered, about 1 ft. long; rhachis clothed at the base with imbricate tubular sheaths; bracts linear-oblong, obtuse, almost membranous, ½–1¼ in. long; pedicels slender, 1½–2 in. long. *Flowers* large, pale rose, the disk of the lip with a large orange blotch. *Sepals* spreading, wide elliptic-oblong, obtuse, about 1 in. long. *Petals* elliptic-ovate, obtuse, 1 in. long. *Lip* shortly clawed, suborbicular, obtuse, nearly 1 in. long, the margin finely toothed, the disk velvety, the lateral lobes involute. *Column* broad, oblong.

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[1] Fig. 1, part of lip; 2, column; 3, pollinia; 4, whole plant:—1-3 *enlarged*, 4 *much reduced*.

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TAB. 8253.

LARIX OCCIDENTALIS.

Western North America.

CONIFERAE. Tribe ABIETINEAE.

LARIX, *Mill.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 442.

Larix occidentalis, *Nutt. Sylva*, 1849, vol. ii. p. 143, t. 120; ed. 1865, p. 199, t. 120; *Sargent in Gard. Chron.* 1886, vol. xxv. p. 652, f. 145, et *Silva of N. Am.* 1898, vol. xii. p. 11, t. 594; *Kent in Veitch Man. Conif.* n. ed. 1900, p. 400, f. 104; *Elwes & Henry, Trees of Great Brit. & Ireland*, vol. ii. p. 395, t. iii.; species ex affinitate *L. Lyellii*, Parl., a qua ramulis haud tomentosis, foliis longioribus, squamis ovuliferis glabris et conis maturis breviter stipitatis differt.

Arbor saepe usque ad 75 m. alta, trunco 1·8–2·4 m. diametro, coma parva anguste pyramidali (*Sargent*); exempla maxima in hortis britannicis vix 11 m. alta. *Rami* dimorphi, brachycladiis multifoliatis. *Folia* angustissima, tetragona, utrinque bisulcata, acuta, costa infra alte carinata, brachycladiorum longiora, interdum, ut in icone, 5–6 cm., sed saepius 3–4 cm. longa, 0·5–0·75 mm. lata, ramorum sterilium rigidiora, usque ad 1–1·25 mm. lata, omnia saepius canalibus 2 intramarginalibus instructa. *Strobili* (vel *flores*) *masculi* subglobosi, circiter 1 cm. diametro, lutei, subsessiles, basi squamis (vel bracteis) latis rubiginosis floccoso-ciliatis ornata. *Strobili* (vel *flores*) *feminei* ovoideo-oblongi, circiter 2 cm. longi. *Carpella* circiter 1 cm. longa, longe caudata, cauda viridi acuta, recurva. *Squamae ovuliferae* fere orbiculares, 2–3 mm. latae. *Coni maturi* subsessiles, suberecti, oblongo-cylindrici, magnitudine variabiles, usque ad 4 cm. longi, fusci; carpella caudata quam squamae seminiferae longiora. *Semina* oblique alata, 8–10 mm. longa.—*Pinus Nuttallii*, Parl. in DC. Prodr. vol. xvi. 2, p. 412.—W. BOTTING HEMSLEY.

Larix occidentalis, according to Professor Sargent, was first observed by Lewis and Clark in the forests of the upper Clearwater River. It was seen also by D. Douglas in 1827 near Fort Colville on the upper Columbia, but was mistaken by him for the European Larch. Thomas Nuttall therefore is to be regarded as its real discoverer; he collected it in the Blue Mountains in 1834 and first described it in the place cited above. It was first planted in the Arnold Arboretum in 1881 and a number of seedlings were sent to Kew by Professor Sargent in the autumn of that year. From one of these, which is now a tree 36 ft. high with the trunk 26 in. in girth near the ground, and is one of a group in the Pinetum at Kew, the figure now given was prepared.

Considerable interest is at present being taken in this American Larch by British foresters; it is hoped that it may

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prove useful as a substitute for the European Larch, whose value in many districts is impaired by its susceptibility to the attacks of *Peziza Willkommii.* The rate of growth indicated above may not compare favourably with that of the average European Larch in British plantations, but when the dryness and poorness of the soil in which the trees grow are taken into account, the figures afford a not unfavourable augury for the success of the species as a forest tree in Britain. The trees at Kew fruit freely, but the cones have never yet been found to contain fertile seed. A tree in the garden of Mr. P. L. de Vilmorin at Verrières-le-Buisson, near Paris, also cones freely but has never yet given good seed. *Larix occidentalis* does not appear to be so hardy as *L. europaea.* According to Mr. Hesse it has proved too tender to be worth growing at Weenen in north-west Hanover, where the European Larch succeeds. It is, however, quite hardy at Kew.

Description.—*Tree,* often reaching 250 ft. in height, with a stem 6–8 ft. thick, and with a small narrow-pyramidal head ; in British collections the largest examples as yet hardly exceed 36 ft. in height; branches dimorphic, the abbreviated branchlets many-leaved. *Leaves* very narrow, quadrangular, 2-sulcate on both faces, acutely and widely keeled beneath, those of the abbreviated branchlets the longer and sometimes, as here shown, $2–2\frac{1}{2}$ in., but often only $1\frac{1}{4}–1\frac{1}{2}$ in. long, $\frac{1}{4}–\frac{1}{3}$ lin. wide; those of the sterile twigs more rigid and $\frac{1}{2}–\frac{3}{8}$ lin. wide, all usually 2-canaliculate. *Male flowers* in yellow, subsessile, subglobose clusters, about $\frac{2}{5}$ in. across, surrounded by broad reddish floccose-ciliate scales or bracts. *Female flowers* in ovoid-oblong cones about $\frac{4}{5}$ in. long. *Carpels* about $\frac{2}{5}$ in. long, recurved, acute, the tips long, green. *Scales* bearing ovules nearly orbicular, $1–1\frac{1}{2}$ lin. wide. *Ripe cones* subsessile, suberect, oblong-cylindric, rather variable in size, the largest up to $1\frac{1}{2}$ in. long, brown; carpels tailed longer than the seed-bearing scales. *Seeds* obliquely winged, $\frac{1}{3}–\frac{2}{5}$ in. long.

Fig. 1, a barren shoot; 2, a branch bearing male flowers; a branch bearing female flowers; 4, a branch bearing mature cones; 5, a stamen; 6 and 7, upper and lower views of young carpel and ovuliferous scale; lower view of mature carpel and seminiferous scale; 9, seed:—Figs. 1-4 *natural size*; the rest *enlarged.*

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M. S. del. J. N. Fitch lith.

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TAB. 8254.

MUSSAENDA TREUTLERI.

Tropical Himalaya and Khasia.

RUBIACEAE. Tribe MUSSAENDEAE.

MUSSAENDA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 64.

Mussaenda Treutleri, *Stapf*; affinis *M. frondosae*, Linn., et *M. macrophyllae*, Wall., sed ab illa (typica, i.e. vars. *zeylanica* et *ingrata*, Hook. f.) indumento sparsiore rudiore, foliis magnis, stipulis latis, sepalis magis herbaceis et praeter margines setoso-ciliatas subglabris, alabastris 5-cornutis, corolla majore, ab hac indumento breviore sparsiore, sepalis multo angustioribus, alabastris 5-cornutis distincta.

Frutex, ramis superne pilis brevibus hirsutis. *Folia* ovata vel ovato-elliptica, breviter acuminata, basi plerumque breviter contracta, 15–30 cm. longa, 7–15 cm. (rarius ultra) lata, utrinque ad nervos hirsuta, imprimis inferne et ad costam, caeterum sparse rudiuscule pilosa; petioli 1·5–4 cm. longi; stipulae late ovatae vel triangulares, acuminatae, saepe bifidae, 1–1·2 cm. longae, ad 6 mm. latae, herbaceae. *Corymbi* congesti, terminales, saepe cymis in axillis foliorum superiorum ortis aucti, multiflori; bracteae inferiores latae, interdum parce laciniatae, superiores sepalis similes; pedicelli brevissimi. *Sepala* linearia vel subulata, longe tenuiterque attenuata, herbacea, praeter margines setoso-ciliatas subglabra, 7–10 mm. longa, ad paulo ultra 1 mm. lata, sematophora nivea, caeterum forma foliorum. *Corolla* ante anthesin 2–3 cm. longa, adpresse tomentosa vel adulta saepe subglabra; limbus aurantiacus, in alabastro 5-cornutus, cornubus saepe longiusculis, segmentis ad 6 mm. longis latisque apiculo caudato tenui; tubus fauce pilis aureis farctus. *Bacca* globosa, siccata, 1–1·2 cm. diametro, mox glabrescens. *M. frondosa* var. *grandifolia*, Hook. f., Fl. Brit. Ind. vol. iii. p. 90. *M. macrophylla*, Wall. Pl. As. Rar. tab. 180, vol. xii.; Lindl. in Bot. Reg. vol. xxxii. tab. 24; Paxt. Mag. Bot. tab. c. p. 197, non Wall. in Roxb. Fl. Ind. ed. Car. vol. ii. p. 228.—O. STAPF.

Mussaenda Treutleri, to which Dr. Stapf has now for the first time accorded its proper status as a distinct species, is an old and well-known garden plant. It was originally discovered by Dr. Wallich in the mountains of Nepal, but was at first mistaken for a form of *M. frondosa*, and issued by him under that name in the Hon. E. I. Company's Herbarium (Cat. Lith. 6250 E in part), but was subsequently confused with *M. macrophylla*, under which erroneous name it is usually cultivated. In the Flora of British India, (vol. iii. p. 90) Sir Joseph Hooker first pointed out that it is distinct alike from *M. macrophylla* and *M. frondosa*; it is there treated as a variety, var. *grandifolia*, of the latter.

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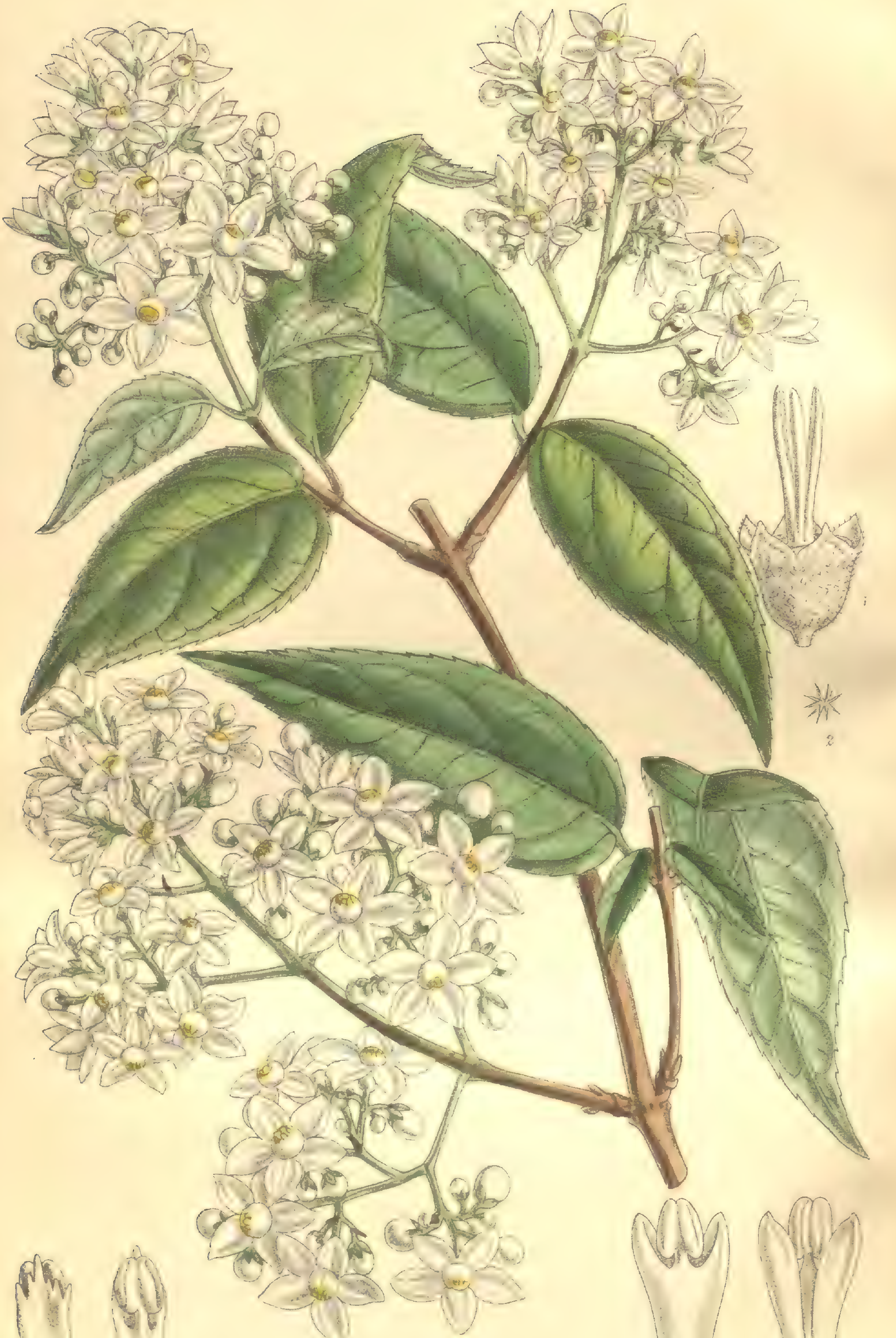
A note on the relationships of these three plants and their immediate allies will shortly appear in the Kew Bulletin.

M. Treutleri was introduced into cultivation by Messrs. Knight and Perry about 1840. It flowered with them in 1844 and again in 1845, and was figured both in the Botanical Register and in Paxton's Magazine of Botany, in the belief that it was *M. macrophylla*, Wall. The area of the species extends from Lower Nepal to Sikkim and the Khasia Hills at elevations of from 2,000 to 6,000 ft. above sea-level. In Sikkim it was collected by Sir Joseph Hooker in 1848, and again by Dr. Treutler in 1860, in dense forest below Birch Hill, near Darjeeling.

At Kew *M. Treutleri* is grown as a stove-plant and forms a shrub about 3 ft. high, with numerous branches which produce terminal heads of flowers in July and August. After flowering the plants are rested dry, and are started into growth again in spring by the application of heat and moisture. Seeds do not mature, but cuttings of the young shoots readily strike roots.

Description.—*Shrub*, branches shortly pubescent upwards. *Leaves* ovate or ovate-elliptic, shortly acuminate, usually shortly cuneate at base, 6–12 in. long, 3–6 in. wide, hirsute on the nerves on both sides, especially beneath and on midrib, elsewhere sparsely harshly hairy; petioles $\frac{2}{3}$–$1\frac{1}{2}$ in. long; stipules wide-ovate or triangular, acuminate, often 2-fid, $\frac{1}{3}$–$\frac{1}{2}$ in. long, $\frac{1}{4}$ in. wide, herbaceous. *Corymbs* many-flowered, dense, terminal, often with additional cymes in the upper axils; lower bracts broad, sometimes slightly laciniate, upper bracts like sepals; pedicels very short. *Sepals* linear or subulate, much and gradually narrowed, herbaceous, almost glabrous except the setose-ciliate edges, $\frac{1}{3}$–$\frac{2}{5}$ in. long, $\frac{1}{4}$–$\frac{1}{2}$ lin. wide, or rather wider; leafy sepal white, otherwise like the leaves. *Corolla* before opening $\frac{3}{4}$–$1\frac{1}{4}$ in. long, adpressed pubescent, when old often almost glabrous; limb orange, in bud 5-horned, the horns often rather long; lobes $\frac{1}{4}$ in. long and broad with slender caudate tips; tube with a lining of orange hairs in the throat. *Berry* globose, dry, $\frac{1}{3}$ in. across, soon glabrescent.

Fig. 1, calyx and pistil; 2, corolla, laid open; 3 and 4, stamens:—*all enlarged.*



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TAB. 8255.

DEUTZIA SETCHUENENSIS.

China.

SAXIFRAGACEAE. Tribe HYDRANGEAE.

DEUTZIA, *Thunb.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 642.

Deutzia setchuenensis, *Franch. in Journ. de Bot.* 1896, vol. x. p. 282; affinis *D. stamineae*, R. Br., a qua foliis longioribus acuminatis, ramulis floriferis longioribus, inflorescentia corymbiformi recedit.

Suffrutex, ramis cinereis glabris, cortice deciduo; ramuli floriferi stellato-puberuli. *Folia* lanceolata vel ovato-lanceolata, longe acuminata, basi rotundata, 5–10 cm. longa, 1·5–3 cm. lata, chartacea, serrulata, utrinque stellato-puberula, nervis primariis utrinque 3–4 arcuatis supra obscuris subtus leviter elevatis; petioli 3–5 mm. longi, stellato-puberuli, supra profunde sulcati. *Inflorescentia* corymbiformis, multiflora, ramis quadrangularibus, bracteis linearibus usque ad 5 mm. longis. *Flores* albi, circiter 1·5 cm. diametro. *Receptaculum* 1·5 mm. longum, extra dense stellato-tomentosum. *Calycis* tubus brevis, segmentis late triangularibus subacutis 1 mm. longis basi 1·5 mm. latis. *Petala* ovato-elliptica, subacuta, 6–7 mm. longa, 5–6 mm. lata, extra breviter stellato-pilosa, pilis 8–10-radiatis, intus glabra. *Stamina* antisepala 4 mm. longa, apice alte bilobata, antipetala 2 mm. longa, apice laciniata. *Styli* distincti, 2·5 mm. longi. *Capsula* subglobosa, circiter 5 mm. diametro, stellato-puberula. *D. corymbiflora*, Lemoine in Gard. Chron. 1898, vol. xxiv. p. 265.—J. HUTCHINSON.

Deutzia setchuenensis is closely related to the Himalayan *D. staminea*, R. Br., but is distinguished from that species by the larger and more acuminate leaves, the longer lateral flowering branchlets and the more spreading inflorescences. The form described as *D. corymbiflora*, Lemoine, has been identified by Mr. Franchet with this species; Mr. Hutchinson, however, points out that Lemoine's plant, as figured in 1902 (Rev. Hort. Belge, vol. xxviii. p. 157) appears to have smaller, less acuminate leaves and pinkish white flowers.

One of the most beautiful members of the genus, *D. setchuenensis*, like many other North Asian shrubs, is often excited into premature growth by warm days in early spring, and on this account its young shoots and flower-buds are frequently destroyed by late frosts. This seriously affects its value as a garden-shrub, though it is perfectly hardy in

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other respects. The plant from which our figure was prepared was presented to Kew in 1897 by Mr. M. L. de Vilmorin, and since then it has never been seriously damaged by genuine winter cold. It will probably have some value as a shrub for forcing into early flower for greenhouse decoration, and will certainly prove a charming acquisition in climates where a sharper line divides winter from spring than is the case at Kew. Like the rest of the Deutzias, it thrives in good loam and is easily increased by means of cuttings made of half-ripened wood. It flowers early in July.

Description.—*Undershrub*, branches ash-grey, smooth, with deciduous bark; flowering twigs stellate-puberulous. *Leaves* lanceolate or ovate-lanceolate, long acuminate, rounded at the base, 2–4 in. long, $\frac{3}{5}$–$1\frac{1}{4}$ in. wide, papery, their margins serrulate, stellate-puberulous on both surfaces; main nerves 3–4-paired, indistinct above, slightly prominent beneath; petioles $\frac{1}{8}$–$\frac{1}{5}$ in. long, stellate-puberulous, channelled above. *Inflorescence* corymbiform, many-flowered, branches 4-angled; bracts linear, $\frac{1}{5}$ in. long. *Flowers* white, about $\frac{3}{5}$ in. across; receptacle $\frac{3}{5}$ in. long, densely stellate-tomentose. *Calyx-tube* short; lobes wide-triangular, subacute, $\frac{1}{2}$ lin. long, nearly 1 lin. long at base. *Petals* ovate-elliptic, subacute, $\frac{1}{4}$–$\frac{1}{3}$ in. long, $\frac{1}{5}$–$\frac{1}{4}$ in. wide, stellate-pilose without, glabrous within. *Stamens* 2-seriate, those opposite the sepals 2 lin. long, deeply 2-lobed, those opposite the petals 1 lin. long, with laciniate tips. *Styles* distinct, $\frac{1}{10}$ in. long. *Capsule* subglobose, about $\frac{1}{5}$ in. across, stellate-puberulous.

Fig. 1, calyx and pistil; 2, stellate hair from receptacle; 3 and 4, longer stamens; 5 and 6, shorter stamens:—*all enlarged.*

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TAB. 8256.

PYRUS PASHIA, var. KUMAONI.

Himalaya.

ROSACEAE. Tribe POMEAE.

PYRUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 626.

Pyrus Pashia, var. Kumaoni, *Stapf*; a *P. Pashia*, Ham. ex Don (typica) **ramis foliis corymbis et calyce extus glabris vel si juventute magis minusve gossypinis mox glabratis et sepalis saepe latius triangularibus et apice minus productis distinguenda.**

Arbor humilis vel mediocris, ramulis glabris vel citissime glabratis exsiccando nigricantibus; gemmae conicae, glabrae, 3–5 mm. longae. *Folia* ovata ad rotundato-ellipticum vel ovato-lanceolatum virgentia, apice sensim attenuata vel obtusa, basi rotundata, margine minute crenulata, plurima 5–9 cm. longa, 3–5 cm. lata, glabra vel citissime glabrata, matura papyracea, nigro-viridia; petioli graciles, plerumque 3–5 cm. longi. *Corymbi* multiflora in ramis abbreviatis, glabri vel cito glabrati; pedicelli circiter 1 cm. longi. *Receptaculum* glabrum. *Sepala* demum decidua, triangularia vel ovata, obtusa vel acuta, raro in apiculum producta, extus glabra, intus magis minusve gossypino-villosa, villis secundum margines glanduloso-ciliolatas diutius persistentibus caeterum interdum evandis. *Petala* primo roseo-suffusa, deinde alba. *Stamina* ultra 25. *Styli* plerumque 5. *Fructus* globosus vel obovoideo-globosus, brunneo-viridis vel brunneus, lenticellis pallidis crebris notatus, ad 3 cm. diametro. *P. Kumaoni*, Dcne, Jard. Fruit. vol. i. sub tab. vii.; Hook. f., Fl. Brit. Ind. vol. ii. p. 374.—O. STAPF.

It has already been suggested by Dr. Schneider (Ill. Handb. Laubholzk. vol. i. p. 665) that the tree cultivated in European collections as *Pyrus Pashia*, which Decaisne has distinguished from the typical form of that species as *P. Kumaoni*, may be no more than a glabrous variety of *P. Pashia* proper. A careful study of the material in the herbarium at Kew has enabled Dr. Stapf to completely confirm this view. *P. Pashia*, taken in its wider sense, ranges throughout the whole of the temperate Himalaya from Kashmir to Bhutan, and extends thence to the Khasia and Naga Hills, to Manipur and northern Burma and into western China. The form now figured was described by Decaisne from a specimen collected by Strachey and Winterbottom in Kumaon between 5,000 and 8,000 ft. above sea-level, where it is said to be common. The form which constitutes the type of the species is one with densely cottony leaves and calyces, which was collected in Nepal by

Buchanan (afterwards Hamilton) and again by Wallich The bulk of the specimens in the Kew herbarium are more or less intermediate between the Nepal and the Kumaon forms, the amount and degree of persistence of the tomentum showing considerable variation.

According to Loudon (Encyc. of Trees and Shrubs, p. 424) *P. Pashia* was first introduced into England in 1825, but the precise history of the tree from which the plate now given was prepared is not known. It has been growing in the collection of Rosaceae at Kew for many years; it is a grafted plant, but is in vigorous health, being now 25 ft. high, 20 ft. in spread of branches, with a trunk 2 ft. 3 in. in girth. It flowers with all the profusion characteristic of its kind, but is more attractive than the majority because of the compactness of its flower-clusters and the full-rounded contour of the individual blossoms. The deep-red anthers, too, show up strongly against the pure white petals, and the tree is worthy of more notice from arboriculturists than it has yet received.

DESCRIPTION.—*Tree*, small to medium in size, with branchlets that blacken on drying, glabrous or soon becoming so; buds conical, glabrous, $\frac{1}{8}$–$\frac{1}{5}$ in. long. *Leaves* ovate tending to rounded-elliptic or ovate-lanceolate, gradually narrowed or at times obtuse at the tip, rounded at the base, finely crenulate, usually 2–3$\frac{1}{2}$ in. long, 1$\frac{1}{4}$–2 in. wide, glabrous or soon becoming so, when full-grown papery, very dark green; petioles slender, 1$\frac{1}{2}$–2 in. long. *Corymbs* many-flowered, on short branchlets, glabrous or soon becoming so; pedicels about $\frac{1}{3}$ in. long. *Receptacle* glabrous. *Sepals* at length falling off, triangular or ovate, obtuse or acute, or occasionally apiculate, glabrous without, more or less cottony-pubescent within, the hairs on their margins glandular and more persistent elsewhere, sometimes disappearing. *Petals* at first suffused with pale rose, at length becoming white. *Stamens* exceeding 25. *Styles* usually 5. *Fruit* globose or obovoid-globose, brownish green or brown, dotted with numerous pale lenticels, over 1 in. in diameter.

Fig. 1, flower about to open; 2, vertical section of flowers, the petals removed, showing bases of filaments and styles; 3 and 4, stamens:—*all enlarged.*

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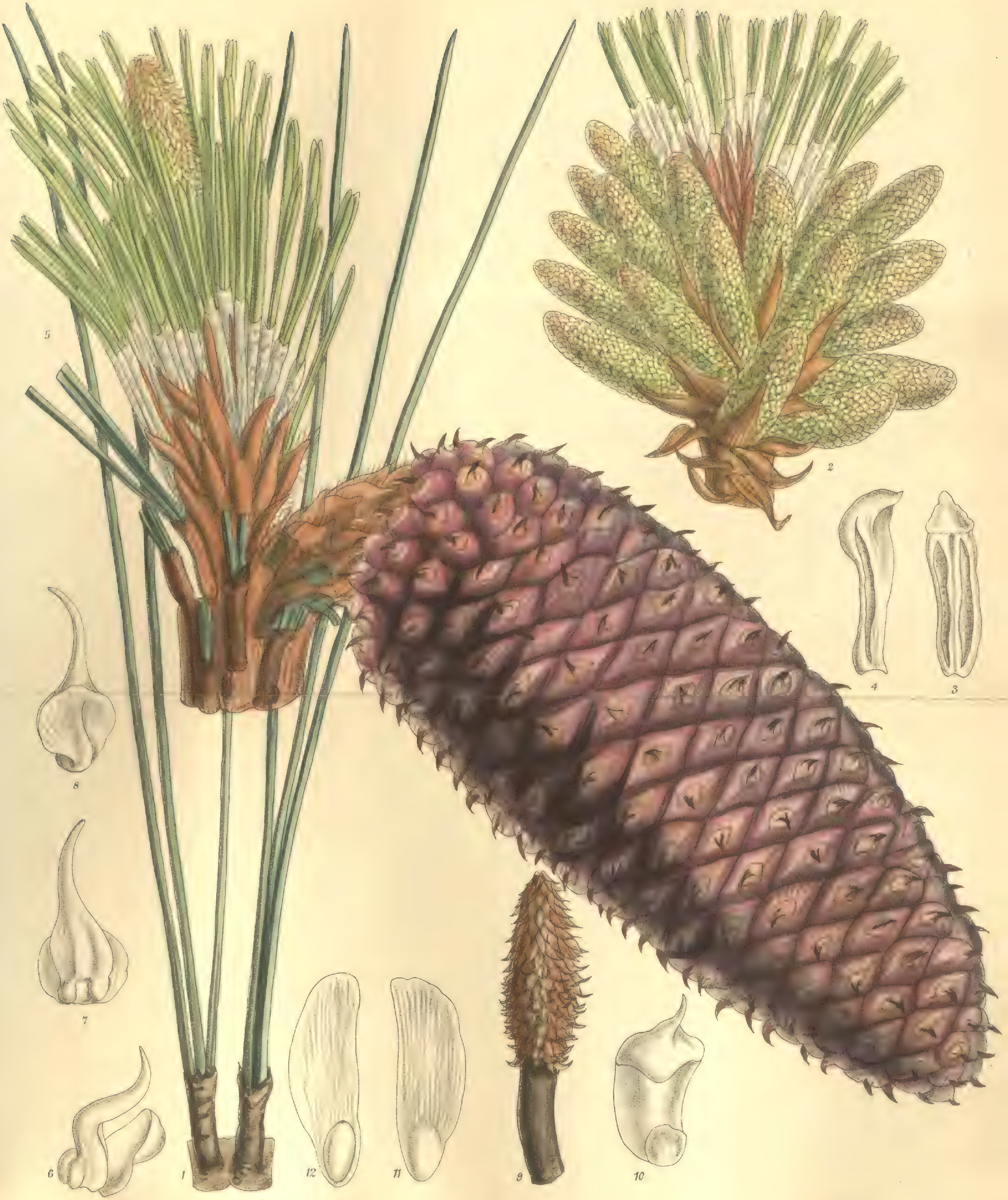
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TAB. 8257.

PINUS JEFFREYI.

Western North America.

CONIFERAE. Tribe ABIETINEAE.

PINUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 438.

Pinus Jeffreyi, *Grev. et Balf. ex Andr. Murr. Rep. Oregon Exped.* [1853] p. 2, cum ic. color.; *Parl. in DC. Prodr.* vol. xvi. pars 2, p. 393; *Hook. f. in Gard. Chron.* 1884, vol. xxii. p. 813, fig. 141; *Mast. in Gard. Chron.* 1889, vol. v. pp. 360, 369, figs. 65, 68; *Lemmon, Handbook of West American Cone-Bearers*, ed. 3, p. 34; species *P. ponderosae*, Laws., arcte affinis et botanicorum nonnullorum ejus varietas, differt innovationibus glaucis foliis saepius longioribus rigidioribus diu persistentibus, floribus masculis flavo-viridibus et conis majoribus purpureis.

Arbor in horto kewense hic illustrata circiter 12 m. alta, ramis floriferis crassissimis. *Folia* primaria seu cataphylla squamiformia, lanceolata, 2–3 cm. longa, longe acuteque acuminata, scariosa, brunnea, nitida, eleganter capillari-fimbriata; secundaria vel vera terna, acicularia, rigida, 15–25 cm. longa, pungentia, dorso convexa, facie interiore biconcava carinata, margine denticulata, scabrida, ductis resiniferis duobus marginalibus instructa; vaginae foliiferae circiter 3 cm. longae, truncatae, primum argenteae, dein nigrescentes, marcescentes. *Strobili* (flores) *masculi* numerosi, ad innovationum basin in axillis cataphyllorum solitarii, confertissimi, involucrati, clavato-cylindrici, 3–5 cm. longi; cataphylla scariosa, brunnea, lanceolata, 1·5–2 cm. longa, acuminatissima, fimbriata. *Involucri squamae* circiter 10–12, cataphyllis similes nisi minores, integrae, haud acuminatae; antherae numerosissimae. *Strobili* (flores) *feminei* pseudoterminales, solitarii, erecti, stipitati, stipite squamis numerosis vestito; carpella parva, demum fere evanescentia; squamae ovuliferae e basi rotundato caudatae. *Coni maturi* vel fere maturi laterales, penduli, inaperti oblongo-cylindrici, 15–18 cm. longi, aperti fere ellipsoidei, brunnescentes, squamis seminiferis pungentibus. *Semina* samaroidea, cum ala circiter 3 cm. longa.—*P. ponderosa*, var. *Jeffreyi*, Vasey Rep. Dep. Agric. U.S. 1875, p. 179; Brewer & Watson, Bot. Calif. vol. ii. p. 126; Sargent, Silva, vol. xi. p. 79, tt. 562, 563.—W. BOTTING HEMSLEY.

The Pine which is here figured was discovered by J. Jeffrey in the Shasta Valley in North California when collecting for an Edinburgh association in 1852. Seeds were sent by him to Edinburgh in the same year, and in a circular to the subscribers issued by Andrew Murray it is explained that these were distributed by the committee under the names given to them by various botanists, the figures and descriptions of the cones, leaves and seeds of the

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Coniferae included in the report being supplied by Dr. Greville and Professor Balfour. This report appears to be rarely met with, and has been little consulted, for the new species with which it deals have been by some attributed to Murray, by others partly to Balfour and partly to Jeffrey. The coloured plate representing *P. Jeffreyi* bears the signature of Dr. Greville. Opinions are divided as to whether this tree deserves specific rank; there is no difficulty in distinguishing the form now described, the account of which is based exclusively on material from a tree in cultivation in the Arboretum at Kew, from cultivated examples of *P. ponderosa*, but it is stated that intermediate wild forms have been met with.

Opinions appear to be similarly divided as to the relative ornamental value of *P. Jeffreyi* and *P. ponderosa*. Sir Joseph Hooker, in the passage referred to above, describes it, as seen by him in a wild state, as inferior to *P. ponderosa* and as by no means a handsome tree; his figure bears out this judgment. Yet, as met with in cultivation, the longer leaves and the larger cones serve to render *P. Jeffreyi* perhaps the more striking of the two. Though neither of these near allies can be considered among the handsomest of Pines, in habit they are both notable in the parks and gardens of this country for their tall, stately, column-like trunks—as a rule, perhaps, too thinly set with branches to make them perfect specimen trees; for their deeply fissured, rugged bark; for their long rigid leaves arranged in a brush-like cluster on the terminal portion of each year's growth; and, more especially as regards *P. Jeffreyi*, for the fine, handsomely coloured cones. Young trees are best reared from imported seed.

DESCRIPTION.—*Tree*, the one here figured about 40 ft. high, with very stout flowering branches. *Cataphyllary leaves* scale-like, lanceolate, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, narrowly long acuminate, scarious, brown, shining, finely fimbriate; leaves proper ternate, acicular, rigid, 6–10 in. long, pungent, convex on the back, biconcave and keeled on the face, margin finely toothed, scabrid, with two marginal resin-ducts; sheaths about $1\frac{1}{4}$ in. long, truncate, at first silvery, at length blackish, persisting. *Male cones* many, at the bases of young shoots, each solitary in the axil of a cataphyllary leaf, densely clustered, involucrate, clavate-cylindric, 1¼–2 in. long; the cataphyllaries scarious, brown, lanceolate, very acuminate, fimbriate, ⅔–¾ in. long. *Involucral scales* 10–12, like the cataphyllaries but smaller, entire and not acuminate; anthers very many. *Female cones* spuriously terminal, solitary, erect, stipitate, the stipe clothed with many scales; carpels small, at length almost disappearing; ovule-bearing scales caudate, with rounded bases. *Fruit-cones* when ripe or nearly so lateral, pendulous, oblong cylindric before opening, 6–7 in. long, almost ellipsoid after opening, becoming brownish; seed-bearing scales pungent. *Seeds* samaroid, including the wing about 1¼ in. long.

Fig. 1, two clusters of mature leaves; 2, a shoot bearing male flowers and young leaves; 3 and 4, anthers; 5, a shoot bearing young leaves, a female flower and a nearly mature cone; 6, 7 and 8, carpel and ovuliferous scale in different positions; 9, a female flower, somewhat advanced; 10, a seed-bearing scale with a trace of the undeveloped carpel; 11 and 12, seeds:—1, 2, 5 *and* 10, *of natural size, the other figures variously enlarged.*

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TAB. 8258.

BEGONIA MODICA.

Tropical West Africa.

BEGONIACEAE.

BEGONIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 841.

Begonia (Scutobegonia) modica, *Stapf in Kew Bull.* 1908, p. 259; species *B. calabaricae*, Stapf, affinis sed ab ea foliis minime cordatis, ovarii alis superne (saltem duabus) latissimis et fructu obpyramidato distincta.

Herba subacaulis. *Foliorum* petioli 3–4 cm. longi, rubescentes, hirsuto-villosi; laminae oblique lateque peltato-ovatae, 5–8 cm. longae, 4–6 cm. latae, leviter crenatae et undulatae, carnosulae, praeter margines obscure rubentes laete virides, supra glaberrimae, subtus molliter hirsutae, nervis 6–8 radiantibus, umbone ubi margini proximo ab eo 1–1·5 cm. remoto. *Pedunculi* pauciflori, 2–3 cm. longi, sparse pilosi. *Flores* umbellati, lutei, 2 masculi pedicellati, 1 femineus subsessilis: masculorum pedicelli ad 18 mm. longi, glabri; sepala 2, rotundato-elliptica, 1 cm. longa, superum extra rubrosuffusum, intus maculo fere sanguineo ornatum, inferum utrinque sulphureum; petala 0; stamina 12–13, filamentis basi in columnam connatis: foeminei sepala ut in masculis sed suborbicularia; petala 0; styli 4, basi breviter connati; stigmata reniformia papillarum serie continua, 1·5 mm. lata; ovarium sub anthesi rubens, 9 mm. longum, 4–5 mm. latum alis inferne paulo attenuatis inclusis.—O. STAPF.

Begonia modica is a member of the section *Scutobegonia*, which includes a small group of species all of them confined to West Africa from Liberia to the Congo. The species of this section are small herbs mostly with peltate leaves and yellow flowers. The plant from which the figure here given has been prepared was raised from one of a number of tubers of the species received at Kew in 1907 from Mr. J. Anderson, Curator of the Botanic Station, Kumasi, who had found them growing in the Gold Coast Colony on rocky ground at an altitude of 600 ft. above sea level. Under the treatment ordinarily accorded to Begonias these tubers developed their leaves and flowered for the first time in September, 1908.

DESCRIPTION.—*Herb*, almost stemless. *Leaves* petioled; petioles $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, reddish, hirsute; blades obliquely widely peltate-ovate, 2–$3\frac{1}{2}$ in. long, $1\frac{1}{2}$–$2\frac{1}{2}$ in. wide, slightly crenate and undulate, somewhat fleshy, bright green, except

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for the faintly reddish margins, quite glabrous above, softly hirsute beneath, nerves 6–8 radiating from the petiole which joins the lamina about $\frac{1}{2}$–$\frac{3}{4}$ in. from the base. *Peduncles* few-flowered, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, sparingly hairy. *Flowers* umbelled, yellow; each umbel of 2 stalked males and a single subsessile female; the males on glabrous pedicels $\frac{3}{4}$ in. long, with 2 rounded-elliptic sepals $\frac{2}{5}$ in. long, the upper flushed outside with red and with a bright red blotch within, the lower yellow on both sides; petals 0; stamens 12–13, their filaments connate below in a column: the female sepals like those of the male flowers, but almost orbicular; petals 0; styles 4, shortly connate below; stigmas reniform with an unbroken series of papillae, $\frac{3}{4}$ lin. wide; ovary in flower reddish, $\frac{1}{3}$ in. long, $\frac{1}{6}$–$\frac{1}{5}$ in. wide including the wings, slightly narrowed towards the base.

Fig. 1, stamen; 2, pistil; 3, stigma; 4, cross-section of young fruit:—*all enlarged.*

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TAB. 8259.

SORBUS CUSPIDATA.

Himalaya.

ROSACEAE. Tribe POMEAE.

SORBUS, *Linn.*; *Hedlund in Svensk. Vet. Akad. Handl.* 1901, vol. xxxv. pp. 1-147.

Sorbus cuspidata, *Hedlund, loc. cit.* p. 89; *K. C. Schneider, Ill. Handb. Laubholzk.* p. 683; species *S. lanata* comparanda, sed foliis haud vel indistincte lobulatis, petiolis intus lanatis, stylis a basi liberis supra medium glabris recedens.

Arbor culta mediocris, spontanea interdum peralta, novellis niveo-lanatis, ramis mox magis minusve glabratis purpureo-fuscis lenticellis conspersis; gemmae ovoideae, subacutae, glabrae. *Folia* elliptica, basi rotundata vel breviter cuneata, apice breviter acuminata subacuta vel obtusa, margine simpliciter vel duplo dentata dentibus irregularibus, interdum brevissime lobulata, 12–20 cm. longa, 7–10 cm. lata, matura firma, supra primo albo-araneosa tandem glabrata, inferne niveo-tomentosa, nervis lateralibus utrinque 12–15 subrectis in dentes excurrentibus; petiolus 1–2·5 cm. longus, robustus. *Corymbi* breves, ad 6 cm. diametro, multiflori, densiusculi, undique niveo-tomentosi; pedicelli breves vel brevissimi. *Receptaculum* fundo glabro viride excepto et *sepala* triangularia vel e basi triangulari lanceolato-subulata albo-villosa. *Petala* alba, intus villosa. *Stamina* circiter 25, antheris purpureis. *Carpella* inter se et cum receptaculo plane connata; styli 3–5 ima basi connata et hic et paulo ultra lanugine floccosa vestiti. *Fructus* globosus ad 2 cm. diametro, calyce persistente coronatus, in planta spontanea ruber, exsiccando fuscescens, lenticellatus, endocarpio tenuiter papyraceo.—*Pyrus vestita*, Wall. Cat. Lith. 679 (nomen tantum); Hook. f. Fl. Brit. Ind. vol. ii. p. 375. *P. crenata*, Lindl. in Bot. Reg. t. 1655; non D. Don. *Crataegus cuspidata*, Spach, Hist. Veg. vol. ii. p. 106.—O. STAPF.

The Nepalese Whitebeam, sometimes met with in collections under the garden names of *Sorbus nepalensis* or *Pyrus nepalensis*, is not confined to the country from which its most familiar name is derived, but extends throughout the temperate Himalaya, at elevations of 8000–10,000 ft. above sea-level, from Garhwal to Sikkim. According to a manuscript note placed by Dr. Schneider in the herbarium at Kew, the tree from the Khasia Hills treated as a variety, *khasiana*, of this species and characterised by the possession of very membranous leaves, is better referred to the genus *Micromeles*.

According to Loudon this species was first introduced into European collections in 1820; the tree from which the plate now given has been prepared was purchased for the

Kew collection from Messrs. Fisher, Son & Sibray of the Handsworth Nurseries, Sheffield, in January, 1904, under the name of *Pyrus Aria himalaica.* As a garden-tree it is, in some respects, the finest of all the Whitebeams in cultivation, especially in regard to the size of its foliage and flowers. The fruits, although large, are not so brightly coloured as in various forms of *P. Aria* itself. This species is somewhat uncertain in its behaviour under cultivation. After growing quite well for a number of years it will, without any ostensible cause, and sometimes in the middle of the active growing season, suddenly droop and soon afterwards die. To this unfortunate circumstance is probably due the fact that although the species came into cultivation in England nearly eighty years ago, there are few, if any, fully grown trees in this country.

Description.—*Tree*, of medium size under cultivation, sometimes of large dimensions in the wild state; innovations white-woolly, branches soon becoming glabrous, purplish-brown and lenticelled; buds ovoid, subacute, glabrous. *Leaves* elliptic, rounded or shortly cuneate at the base, shortly acuminate or subacute or obtuse at the apex, irregularly simply or double toothed and sometimes slightly lobulate, 5–8 in. long, 3–4 in. wide, firm when full grown, at first loosely white-pubescent but soon glabrous above, persistently white-tomentose beneath, lateral nerves 12–15 on each side ending in the marginal teeth; petiole stout, $\frac{1}{3}$–1 in. long. *Corymbs* short, 2½ in. across, many-flowered, rather dense and white-tomentose; pedicels short or very short. *Receptacle* with a green glabrous base, elsewhere white-villous as are the triangular or lanceolate-subulate sepals. *Petals* white, villous within. *Stamens* about 25; anthers purple. *Carpels* connate and at the same time adnate to the receptacle; styles 3–5, connate at the base and woolly below. *Fruit* globose, $\frac{4}{5}$ in. across, tipped by the persistent calyx, red in the wild state, reddish-green in cultivated examples, brownish as it ripens, lenticelled; endocarp thinly papery.

Fig. 1, longitudinal section of a flower, the petals removed; 2, petal, seen from upper side; 3, transverse section of receptacle and ovary; 4, branch of fruiting corymb; 5, longitudinal section of fruit:—1-3 *enlarged*, 4 *and* 5 *of natural size.*

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TAB. 8260.

PRUNUS JAPONICA.

China and Japan.

ROSACEAE. Tribe PRUNEAE.

PRUNUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 609.

Prunus (Cerasus) **japonica,** *Thunb. Fl. Jap.* 1784, p. 201; *Sieb. et Zucc. Fl. Jap.* p. 172, t. 90; *Bot. Reg.* t. 27 (var. floribus plenis); *Schneider, Ill. Handb. Laubholz.* vol. i. p. 612; affinis *P. humili*, Bunge, sed ramis glabris, foliis majoribus, petalis integris differt.

Frutex, ramis et ramulis glabris, cortice cinereo-fusco glabro. *Folia* ovato-lanceolata vel lanceolata, basi rotundata vel cuneata, acuminata vel acuta, usque ad 7 cm. longa et 3 cm. lata, duplo-serrata, utrinque glabra, nervis utrinque 3–6 supra leviter immersis subtus elevatis; petioli usque ad 7 mm. longi. *Stipulae* lineari-setaceae, circiter 5 mm. longae, ciliatae. *Gemmae* subglobosae. *Pedunculi* 1–3-flori; bracteae oblongae, obtusae, serrulatae. *Receptaculum* subcampanulatum, 2 mm. longum, glabrum. *Calycis* segmenta ovato-oblonga, obtusa, 2–3 mm. longa, 2 mm. lata, patentia, glanduloso-ciliata. *Petala* obovata, basi attenuata, 7 mm. longa, 5 mm. lata, glabra, rosea, horizontaliter patentia. *Stamina* circiter 25; filamenta glabra, inaequalia, suberecta. *Carpella* 1–2, oblique elliptica, superne parce pilosa: stylus 5 mm. longus, inferne parce pilosus, superne glaber, stigmate parvo capitato. *Drupa* globosa, vix ultra 1 cm. diametro, saturate coccinea.—*Prunus glandulosa*, Thunb. Fl. Jap. p. 202, quoad plantam florentem, fide Maxim. *P. sinensis*, Pers. Syn. Pl. vol. ii. p. 36. *P. chinensis*, Blume, Bijdr. p. 1104? *Cerasus japonica* et *C. glandulosa*, Loisel. in Nouv. Duham. vol. v. p. 33. *Amygdalus pumila*, Sims in Bot. Mag. t. 2176; non Lour.—J. HUTCHINSON.

Prunus japonica is nearly allied to *P. humilis*, Bunge, figured in this work at plate 7335, but is readily distinguished by the glabrous branches, larger leaves and entire petals. More familiar in its double-flowered form, which has long been one of the most popular of hardy shrubs, especially for forcing into early flower for greenhouse decoration, the species in its natural condition, here figured, is nevertheless very pretty, and has, in its bright red cherries, an attraction which its more showy variety does not possess. The double-flowered form, figured at plate 2176 of this work under the name *Amygdalus pumila*, is said by Bretschneider to have been in cultivation in the Jardin des Plantes at the end of the eighteenth century, though, according to Nicholson, it

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was not introduced to English gardens till 1869. At first it was imagined that this double-flowered cherry was a form of *P. humilis.* This impression was dispelled when the typical variety here figured was introduced to western horticulture. According to Bretschneider it first became known in British gardens in 1835, when it was introduced from China by a son of Mr. John Reeves. It was not however obtained for the Kew collection until November, 1902, when the plant from which the present plate has been prepared was presented by Messrs. Veitch from their Coombe Wood nursery. This plant is now about 3 ft. high, and thrives in a sunny border in loamy soil. It has produced fruit in great abundance during the last three years, all the younger parts of the bush being plentifully furnished with its bright cherries, which are extremely acid and astringent. The plant can be propagated by seeds, cuttings and layers, but of the three methods the last is found to be the most satisfactory for obtaining good plants quickly.

DESCRIPTION.—*Shrub*, the branchlets, branches and greyish-brown bark glabrous. *Leaves* ovate-lanceolate or lanceolate, acuminate or acute, with rounded or cuneate base, 2–2$\frac{3}{4}$ in. long, 1–1$\frac{1}{4}$ in. wide, the margins doubly serrate, both surfaces glabrous, nerves 3–6 on each side slightly depressed above and prominent beneath; petioles $\frac{1}{4}$–$\frac{1}{3}$ in. long; stipules linear-setaceous, ciliate, about $\frac{1}{5}$ in. long. *Buds* subglobose. *Peduncles* 1–3-flowered; bracts oblong, obtuse, serrulate. *Receptacle* almost campanulate, 1 lin. long, glabrous. *Calyx-lobes* ovate-oblong, obtuse, 1–1$\frac{1}{2}$ lin. long, 1 lin. wide, spreading, glandular-ciliate. *Petals* obovate, narrowed to the base, $\frac{1}{3}$ in. long, $\frac{1}{5}$ in. wide, glabrous, rose-pink, spreading horizontally. *Stamens* about 25; filaments glabrous, unequal, suberect. *Carpels* 1–2, obliquely elliptic, slightly hairy above; style $\frac{1}{5}$ in. long, slightly hairy below, glabrous above; stigma small, capitate. *Drupes* globose, about $\frac{2}{5}$ in. in diameter, bright red.

Fig. 1, bud; 2 and 3, stamens; 4, carpel:—*all enlarged.*

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TAB. 8261.

CORNUS MACROPHYLLA.

Eastern Asia.

CORNACEAE.

CORNUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 950.

Cornus macrophylla, *Wall. in Roxb. Fl. Ind.* ed. Carey & Wall. vol. i. (1820), p. 433; *C. B. Clarke in Hook. f. Fl. Brit. Ind.* vol. ii. p. 744, exempl. foliis alternis et var. *Stracheyi* exclus.; *Collett, Fl. Siml.* p. 219; *Brandis, For. Fl.* p. 252, t. 32; *Hemsl. in Journ. Linn. Soc. Bot.* vol. xxiii. (1888), p. 345; *J. Veitch in Journ. R. Hort. Soc.* 1902-3, vol. xxvii. p. 861, cum habitus figura; non *C. macrophylla*, Koehne, Shirasawa et botanicorum hortulanorumque aliorum nonnullorum; inter species sinenses foliis oppositis *C. Mombeigii*, Hemsl., proxima, differt imprimis in fere omnibus partibus minus hirsutis pilis argenteis arctissime appressis obscuris et foliis nunquam fere orbicularibus.

Arbor saepius 5-10 m., interdum usque ad 15 m. alta, nisi flores glabrescens vel obscure puberula. *Rami* florigeri graciliusculi, rubescentes. *Folia* opposita, petiolata; lamina papyracea, saepius ovata, interdum lanceolata vel elliptica, saepius 10-15 cm. longa, nunc longiora nunc breviora, caudato-acuminata, acutissima, basi cuneata vel rotundata, interdum inaequalia, supra glabra vel cito glabrescentia, infra pallida vel glauca, pilis argenteis medio affixis arctissime appressis plus minusve vestita, raro glabrescentia; nervi primarii utrinque saepius 5-7, rarius in eodem ramo 4-8, sat conspicui; petiolus gracilis, 3-5 cm. longus. *Flores* tetrameri, albo-lutei, 1·25-1·5 cm. diametro, in cymas compositas stipitatas terminales et laterales dispositi. *Cymae* 6-12 cm. diametro ramis glabris vel glabrescentibus, ebracteatae, ebracteolatae; pedicelli quam flores breviores. *Calyx* pilis argenteis densissime vestitus, 2-3 mm. longus; tubus distincte costatus dentibus minutis. *Petala* valvata, lanceolata, obtusiuscula, patentia vel recurva, extra pilifera. *Stamina* quam petala breviora, antheris dorso affixis. *Drupa* globosa, 5-7 mm. diametro, apice haud excavato.—*C. brachypoda*, C. A. Mey. in Mém. Acad. Pétersb. 1845, vol. vii. p. 223, et in Ann. Sc. Nat. sér. 3, vol. iv. p. 74; Koehne in Gartenfl. vol. xlvi. p. 94; Rehder in Sargent, Trees & Shrubs, vol. i. p. 81, t. 41. *C. sanguinea*, Thunb. Fl. Jap. p. 62; non Linn. *C. Thelicanis*, Lebas in Rev. Hort. 1875, p. 394, f. 64. *C. crispula*, Hance in Journ. Bot. 1881, vol. xix. p. 216. *C. ignorata*, Shirasawa, Ic. Ess. For. Jap. vol. i. p. 121, t. 77, figs. 1-12; non K. Koch. *C. corynostylis*, Koehne in Gartenfl. 1896, vol. xlv. p. 286, fig. 51; Mitt. der Deutsch. Dendrol. Gesellsch. 1903-1905, pp. 33, 36, 44. *C. Theleryana*, *C. Religiana*, Hort., et *C. glauca*, Blume Mss.—W. BOTTING HEMSLEY.

Cornus macrophylla is the largest of all the Cornels that are hardy in the average climate of Great Britain. It is represented in the Kew Arboretum by several young trees, the largest of which, however, is not more than 10 ft. high.

JUNE, 1909.

Veitch has figured a specimen, growing at Coombe Wood, which is 17 ft. high by 12 ft. through. As a rule it forms a bushy tree branching from the base; according to Veitch it flowers very freely in alternate seasons. In the wild state *C. macrophylla* has an unusually wide range from the North-West Himalaya eastward to China and Japan, and varies very little except in the size and shape of its leaves throughout this area. Though introduced into English collections as long ago as 1827, it is by no means frequently met with, and while in this country—owing to the fact, perhaps, that authentic specimens of Wallich's *C. macrophylla* have been readily available for examination, and that these all undoubtedly belong to the species now figured—there has been no confusion with regard to the name it should bear, matters have been otherwise in continental and American collections. Mr. Hemsley, who has carefully disentangled the confusion that has found its way into dendrological literature, points out that the cause of this confusion is due to the existence in collections of two species of *Cornus*, one with alternate and one with opposite leaves. That with opposite leaves, as a reference to the original specimens at once shows, is Wallich's *C. macrophylla.* This opposite-leaved species was, however, a quarter of a century after the publication of the original description, again described by Meyer as *C. brachypoda.* On the Continent and in America Meyer's name has been adopted for the opposite-leaved species, and Wallich's name has been erroneously applied to that which has the leaves and branches alternate. In British collections the identity of the opposite-leaved species has never been in doubt, but by a converse error the name *C. brachypoda* has been applied to that with alternate leaves and branches. Koehne and Rehder indeed would treat the Japanese form of the species now figured, on which *C. brachypoda*, C. A. Mey., is based, as distinct from the Himalayan form, but owing to the erroneous impression that the plant which Wallich described has alternate leaves, they employ for what is undoubtedly *C. macrophylla*, Wall., a new name, *C. corynostylis*, Koehne. As a matter of fact, it is the species with alternate leaves and branches, grown in English collections under the erroneous name *C. brachypoda* and in the collections of other countries under the equally erroneous name *C. macro-*

phylla, that stands in need of a distinctive name. For this alternate-leaved Cornel Mr. Hemsley proposes the name *C. controversa.*

C. macrophylla thrives best in good loamy soil in a sunny position, and the only special treatment called for is the pruning away of the lower branches, so that a clean trunk 5 or 6 ft. high may form. If this be done, it makes a very handsome small tree of distinct and striking aspect. The most suitable use for it in the garden, perhaps, is as an isolated specimen on the lawn.

Description.—*Tree*, usually 15–30, sometimes up to 50 ft. high, all parts except the flowers glabrous or obscurely puberulous; flowering branches rather slender, dull reddish. *Leaves* opposite, usually ovate, sometimes lanceolate or elliptic, generally 4–6 in. long, but at times longer or shorter, tapering to a caudate-acuminate apex, base rounded or cuneate sometimes unequal, papery, glabrous or soon glabrescent above, beneath pale or glaucous usually more or less beset with small closely adpressed centrally attached hairs; main-nerves conspicuous, usually 5–9 on each side, occasionally on leaves of the same branch 4 or 8; petiole slender, 1¼–2 in. long. *Flowers* 4-merous, yellowish-white, ⅓–½ in. across, in compound stipitate terminal and lateral cymes 2½–5 in. across, with glabrous or glabrescent branches and without bracts or bracteoles; pedicels shorter than the flowers. *Calyx* 1–1½ lin. long, densely covered with silvery hairs; tube distinctly ribbed, teeth minute. *Petals* valvate, lanceolate, somewhat obtuse, spreading or recurved, hairy without. *Stamens* shorter than the petals; anthers dorsifixed. *Drupes* globose, 2½–3½ lin. across, the tip not hollowed.

Fig. 1, a flower-bud; 2, an expanded flower; 3, calyx and pistil; 4 and 5, anthers:—*all enlarged.*

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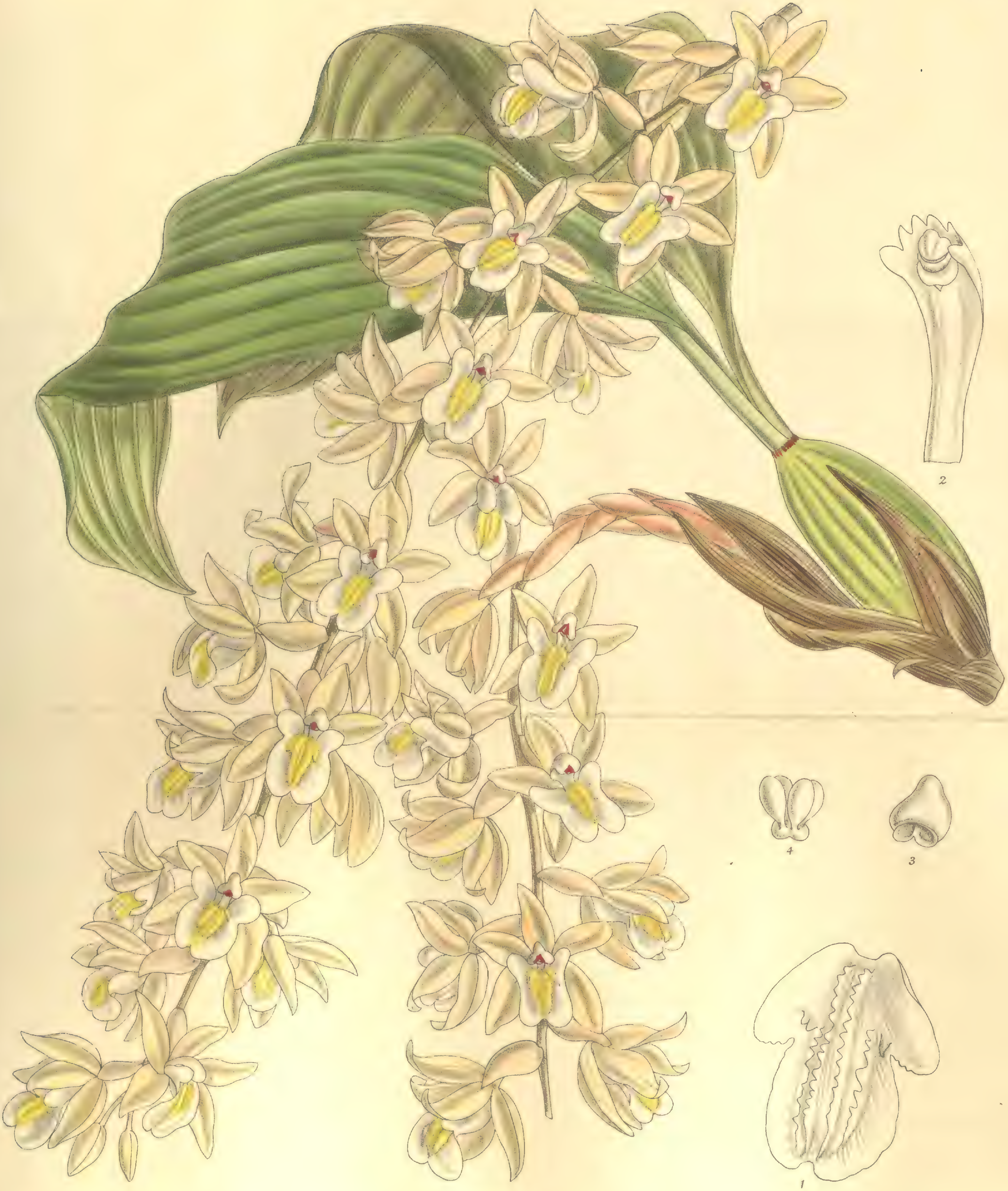

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TAB. 8262.

COELOGYNE VENUSTA.

Yunnan.

ORCHIDACEAE. Tribe EPIDENDREAE.

COELOGYNE, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 518; *Pfitzer in Engl. Pflanzenr. Coelogyninae*, p. 20.

Coelogyne venusta, *Rolfe in Gard. Chron.* 1904, vol. xxxv. p. 259; *Orch. Rev.* 1904, p. 135; *Pfitzer in Engl. Pflanzenr. Coelog.* pp. 71, 72, fig. 26 B; a *C. Dayana*, Reichb. f., labelli lobis lateralibus oblongis, lobo intermedio obovato-oblongo, carinis 2 sulco profundo disjunctis, additis utrinque 2 brevioribus differt.

Herba, pseudobulbi elliptico-oblongi, subtetragoni, sulcati, basi vaginis lanceolatis vestiti, in rhizomate repente satis distantes, diphylli, 4–6 cm. longi, 2–2·5 cm. crassi. *Folia* in petiolum brevem angustata, elliptico-oblonga vel lanceolata, acuminata, supra nitida, 12–18 cm. longa, 2·5–4·5 cm. lata, nervis 3 subtus prominentibus percursa. *Scapi* penduli, graciles, multiflori, 25–35 cm. longi, basi vaginis lanceolatis acutis obtecti. *Bracteae* late ellipticae, obtusae, convolutae, persistentes, circa 1·5 cm. longae. *Pedicelli* graciles, circa 1·5 cm. longi. *Flos* pallide lutescens, labellum album, lobi laterales uti centrum lobi medii lutei, carinae brunneo-maculatae. *Sepala* ovato-oblonga, apiculata, concava, dorso carinata, 1·2–1·5 cm. longa. *Petala* lineari-oblonga, acuta, 1·2–1·5 cm. longa. *Labellum* trilobum, concavum, 1·2–1·5 cm. longum; lobi laterales erecti, semioblongi, antice rotundati; lobus medius late obovato-oblongus, undulatus, emarginatus; carinae 4, undulatae, quarum 2 ad basin extensae, sulco profunde separatae, 2 brevioribus utrinque extra additis. *Columna* arcuata, late alata, 1 cm. longa.—R. A. ROLFE.

Coelogyne venusta is a very distinct species which Mr. Rolfe would refer to the section Tomentosae, but which the late Dr. Pfitzer was inclined, on account of the remarkable lip, to treat as the type of a separate section, the Venustae. A smaller plant than most of its nearer allies, it is distinguished from all of them by the relatively greater size of the anterior as compared with the lateral lobes of the lip. For its introduction to this country, from S.W. China, horticulture is indebted to Messrs. Sander of St. Albans; a plant supplied by them flowered in 1904 at Glasnevin, whence came the material on which the original account of the species was based. It thrives well under the conditions suited to the Himalayan Coelogynes.

JULY, 1909.

DESCRIPTION.—*Herb*, pseudobulbs elliptic-oblong, sulcate and slightly 4-angled, their bases clothed with lanceolate sheaths, 2-leaved, about 2 in. long and ¾ in. wide, about an inch apart on the creeping rootstock. *Leaves* narrowed to a short petiole, elliptic-oblong or lanceolate, acuminate, shining above, 5–7 in. long, 1–1¾ in. wide, prominently 3-nerved beneath. *Scapes* slender, many-flowered, pendulous, 10–14 in. long, clothed below with acute lanceolate sheaths; bracts wide-elliptic, obtuse, convolute, persistent, 7 lin. long; pedicels slender, about equalling the bracts. *Flowers* pale yellow; lip white, lateral lobes and centre of mid-lobe yellow, the keels with brown markings. *Sepals* ovate-oblong, apiculate, concave, keeled behind, 6–7 lin. long. *Petals* linear-oblong, acute, 6–7 lin. long. *Lip* 3-lobed, concave, 6–7 lin. long; side-lobes erect, semi-oblong, rounded at the apex; anterior lobe wide obovate-oblong, undulate, emarginate; keels 4, undulate, two extending along the disk to near the base with a deep channel between, with two shorter lateral ridges. *Column* curved, broadly winged, about 5 lin. long.

Fig. 1, lip; 2, column; 3, anther-case; 4, pollinia:—*all enlarged.*

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TAB. 8263.

ALOE RUBROLUTEA.

Tropical South-west Africa.

LILIACEAE. Tribe ALOINEAE.

ALOE, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 476; *Dyer, Fl. Trop. Afr.* vol. vii. p. 454.

Aloe rubrolutea, *Schinz in Bull. Herb. Boiss.* vol. iv. App. iii. (1896), p. 39; *Bak. in Dyer, Fl. Trop. Afr.* vol. vii. p. 460; *Berger in Engl. Pflanzenr.* vol. iv. 38, 3, ii. p. 221, fig. 80; species ex affinitate *A. pergrassae*, Tod., a qua differt praesertim trunco columnari, et *A. littoralis*, Bak., quae folia habet angustiora et longiora.

Caulis validus, simplex, circa 1–2 5 m. et ultra altus, foliorum rosula copiosa coronatus foliisque exsiccatis deflexis onustus. *Folia* lanceolato-ensiformia, basi planiuscula, ex medio sensim acuminata et canaliculata, carnosa, epidermide coriacea, glauco-viridia vel saepe rubescentia, 55-60 cm. longa et 9–11 cm. lata, juniora erecto-patentia, seniora deflexa, ad margines obtusos aculeis basi crebrioribus et superne remotioribus deltoideis uncinatis corneis validis 4–5 mm. longis instructa. *Inflorescentia* ramosa, pedunculo robusto inclusa folia vix vel paullum superans 60–65 cm. longa; rami erecto-patentes superne bracteis vacuis pluribus muniti; racemi subdensi, elongati, erecti, 30 cm. longi; bracteae ad racemi apicem imbricatae, demum patulae et deinde reflexae, lanceolatae, 3(–5–8)-nerviae, acutiusculae, scariosae, 15–18 mm. longae; pedicelli bracteis breviores, 5–10 mm. longi, erecti, fructiferi demum elongati. *Perianthium* laete rubrum, 30 mm. longum, subcylindraceum basi rotundatum, supra ovarium vix constrictum et faucem versus paullum ampliatum; segmenta exteriora basi breviter vel usque medium connata, 3- vel plurinervia, interiora obtusiora pallidiora, apice fusco uninervio in faucem erectam angustam conniventia. *Stamina stylusque* vix vel breviter exserta. *Capsula* oblonga, grisea, 25 mm. longa, 10-12 mm. lata, erecta. *Semina* numerosa, oblonga, fusca, ala lata membranacea grisea cincta.—*A. Schinzii*, Bak. in Dyer, Fl. Trop. Afr. vol. vii. p. 459.—A. BERGER.

Aloe rubrolutea appears to have a wide range in the Kalahari desert and in German South-west Africa where it has been collected by several travellers. It is said to be plentiful in the neighbourhood of the Etasa Lake and on the mountains near Klein Windhoek. Dr. Schinz gives the stems as from 3½–5 ft. in height, but Mr. Dinter reports them as reaching 8 ft., and judging from photographs even taller individuals are not infrequent; indeed in the wild state it appears to come nearest in size to *A. dichotoma.* It has been repeatedly introduced to Europe by Dinter, and seems to have also been collected by Dr. Baum during his Kunene-Zambesi expedition. The plant from which the figure now given was made was sent alive as a young specimen by Dinter from Windhoek, in 1904, to the late Sir T.

Hanbury in whose garden at La Mortola it flowered for the first time in November, 1907; this is possibly the first record of the species having flowered in Europe. The same plant flowered again in November, 1908, and afforded the material utilised for our plate. Seedlings of this species are now probably frequent in gardens. They look rather unlike the adult plant as their leaves are densely covered with round white spots, which gradually become less frequent and ultimately disappear as the plants grow larger. Even at La Mortola the species is not quite hardy; though rather quick-growing and otherwise presenting no cultural difficulty, it is sensitive to cold. Like many other Aloes, *A. rubrolutea* is a very ornamental green-house plant, and like other tropical species may perhaps do well in a temperate house; it should if possible be given a place in a border with rich but gravelly soil. Strong and old specimens will certainly prove handsome and valuable objects in a collection.

DESCRIPTION.—*Stem* unbranched, stout, 8 ft. or more in height, covered with old leaves; in the young plant here figured only 6 in. high, 2½ in. thick. *Leaves* about 20 in a dense rosette, lanceolate-ensiform, spreading and flat at the base, slightly wider at the middle, thence acuminate and channelled to the acute tip, thick and fleshy, glaucous-green, the margins beset with brown deltoid and somewhat hooked spines, about 2 ft. long, 4½ in. wide; in the La Mortola specimen 17 in. long. *Panicle* much-branched, branches somewhat spreading, naked below but with a few empty bracts under the raceme. *Racemes* about 1 ft. long, cylindric, slender, with many rather lax, drooping flowers; bracts whitish, lanceolate, acute, 3–8-nerved, ½–¾ in. long, at first imbricate, at length more or less reflexed; pedicels 3–5 lin. long, much elongated in fruit. *Perianth* straight, cylindric, somewhat widened near the top, bright red, 1¼ in. long; outer segments united at the base or nearly half-way, linear-lanceolate, acute, with 3 or more veins; inner segments obtuse with dark-brown tips. *Stamens* and *style* hardly exceeding the perianth. *Capsule* oblong, 1 in. long, many-seeded. *Seeds* with a greyish, oblong, thin wing.

Figs. 1 and 2, stamens; 3, ovary; 4, an entire plant:—1–3 *enlarged*, 4 *much reduced.*

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M.S. del. J.N.Fitch lith.

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Tab. 8264.

RUBUS canadensis.

Eastern North America.

Rosaceae. Tribe Rubeae.

Rubus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 616; *Focke in Engl. & Prantl. Pflanzenfam.* vol. iii. pars iii. p. 28.

Rubus (Eubatus) canadensis, *Linn. Sp. Pl.* ed. 1 (1753), p. 494; *Torr. & Gray, Fl. N. Amer.* vol. i. p. 455; *Bailey, Cyclop. Amer. Hort.* vol. iv. p. 1583; *Robins. & Fernald in Gray, New Man. N. Amer. Bot.* ed. 7, p. 490; inter species Americanas caulibus inermibus vel leviter aculeolatis, foliis subglabris, floribus in racemis dispositis distinctus.

Frutex erectus vel suberectus. *Caules* inermes vel interdum leviter aculeolati, subteretes, crassiusculi, brunnei; novelli minute puberuli; internodii 5–7 cm. longi. *Folia* 3-5-foliolata; petioli glabri, 4–8 cm. longi; foliola ovata vel elliptico-ovata, acuta vel caudato-acuminata, crebre et argute dentata, utrinque glabra, lateralia subsessilia, 5–8 cm. longa, 2–5 cm. lata, terminalia longe petiolulata, 10 cm. longa, 5–6 cm. lata; stipulae lineares, acuminatae, circa 1 cm. longae. *Racemi* 6–8 cm. longi, laxi. *Bracteae* lanceolato-oblongae, acutae, 7–8 mm. longae. *Pedicelli* graciles, subpubescentes, 2–3 cm. longi. *Flores* 2–3 cm. lati. *Sepala* deltoideo-ovata, acuminata, 5 mm. longa, puberula, albo-marginata. *Petala* obovata, alba, 1–1·5 cm. longa. *Stamina* numerosissima; filamenta glabra, 5–7 mm. longa. *Carpellae* glabrae; styli glabri, 2·5 mm. longi. *Drupae* succulentae, nigrae.—*R. Millspaughii*, Britton in Bull. Torr. Club. vol. xviii. (1891), p. 366; Britt. & Br. Ill. Fl. N. Amer. vol. ii. p. 203, with fig. *R. amabilis*, Blanchard in Rhodora, vol. viii. (1906), p. 173.—R. A. Rolfe.

The plant here figured is one of the most distinct and attractive of the many *Rubi* recently brought into cultivation. The Kew example was presented to the national collection by Professor Sargent of the Arnold Arboretum in 1902, and has since its introduction been cultivated under the name *R. Millspaughii* proposed by Dr. Britton. Professor Bailey has, however, definitely identified it with the true *R. canadensis* of Linnaeus, and this name is here accordingly adopted. Popularly known as the "Thornless Blackberry," *R. canadensis* appears to extend in a wild state from Eastern Canada, through the highlands of New England, New York and Michigan to the mountains of North Carolina. In habit our plant resembles the common Raspberry, forming sturdy, erect stems 6 or 7 ft. high. The

July, 1909.

flowers are produced in June in large, racemose inflorescences which spring from each node on the upper part of the previous year's growth. The plant thrives well in an ordinary border of loamy soil, and the only special attention it requires is the cutting away of the old stems after fruiting.

DESCRIPTION.—*Shrub*, erect or suberect, stems unarmed or occasionally slightly thorny, roundish, rather thick, brown; new shoots finely puberulous; internodes 2–3 in. long. *Leaves* 3–5-foliolate; petioles glabrous, $1\frac{1}{2}$–3 in. long; leaflets ovate or elliptic-ovate, acute or caudate-acuminate, closely sharply toothed, glabrous on both surfaces, the lateral almost sessile, the distal distinctly stalked, 2–4 in. long, 1–$2\frac{1}{2}$ in. wide; stipules linear, acuminate, $\frac{1}{3}$ in. long. *Racemes* lax, $2\frac{1}{2}$–3 in. long; bracts lanceolate-oblong, acute, $\frac{1}{3}$ in. long; pedicels slender, slightly pubescent, $\frac{3}{4}$–$1\frac{1}{4}$ in. long; individual flowers $\frac{3}{4}$–$1\frac{1}{4}$ in. across. *Sepals* deltoid-ovate, acuminate, nearly $\frac{1}{4}$ in. long, white-margined, puberulous. *Petals* obovate, white, $\frac{2}{5}$–$\frac{3}{5}$ in. long. *Stamens* very many; filaments glabrous, $\frac{1}{5}$–$\frac{1}{3}$ in. long. *Carpels* glabrous; styles glabrous, $\frac{1}{10}$ in. long. *Drupes* black, fleshy.

Fig. 1, section of flower after fall of petals and stamens; 2, stamens; 3, carpel:—*all enlarged.*

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TAB. 8265.

PYRUS RINGO.

Japan.

ROSACEAE. Tribe POMEAE.

PYRUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 626.

Pyrus Ringo, *Wenzig in Linnaea*, vol. xxxviii. p. 37; affinis *P. spectabili*, Ait., sed foliis maturis ipsis subtus tomentosis latioribus grossius serratis, receptaculo calyceque extra tomentosis, petalis minus rubicundis, fructu basi plerumque depresso distincta.

Arbor parva ramulis junioribus magis minusve tomentosis mox glabratis nigro-brunneis. *Folia* elliptico-ovata, basi rotundata vel brevissime cuneata, subacuta vel subacuminata, argute crenato-serrata, 6–10 cm. longa, 3–6 cm. lata, matura firmula, supra juniora parce pilosa, mox glabrata, subtus ipsa matura magis minusve tomentosa; petioli 1–2 cm. longi, demum glabri; stipulae foliaceae, lanceolatae. *Corymbi* sessiles, 2-6-flori; bracteae subulatae, lanatae; pedicelli 2·5–3 cm. longi, lanato-villosi, demum glabrati. *Receptaculum* sub anthesi magis minusve villosum deinde glabrescens. *Calycis laciniae* lineari-lanceolatae, acuminatae, 6–7 mm. longae, utrinque villosulae. *Petala* late elliptica, breviter unguiculata, alba, in alabastro et extra rubicunda. *Styli* basi villosi. *Fructus* ovoidei, ad 3 cm. longi, ad 2·5 cm. diametri, flavidi, calyce persistente coronati.—*Malus Ringo*, Siebold, Catal. Rais. 1856, p. 5; Koehne, Deutsche Dendrol. p. 260; Schneider, Handb. Laubholzk. vol. i. p. 716.—O. STAPF.

The name Ringo first appeared in Siebold's "Catalogue raisonné" of 1856, which records a considerable number of new introductions from Japan. Though we employ here for this Japanese Crab the name that accords with the treatment of the Pomeae adopted in the "Genera Plantarum," it is to be noted that Siebold in the first instance referred the Ringo to *Malus*, and there is much to be said in favour of treating the group of forms to which this term is applied as a distinct genus; this treatment is accorded to *Malus* in the recent authoritative works of Koehne and Schneider. The latter dendrologist records the examination by him of specimens from a tree in the Jardin Plantières the introduction of which is said to be traceable to Siebold, and the conclusion to which he has been led is that the Ringo represents a cross between *P. spectabilis* and some form of the common apple.

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The tree from which the present plate was prepared has long been in cultivation at Kew and is now about 14 ft. high, and no form of *Pyrus* in the collection is better worth cultivating for the beauty of its fruits than this. These hang from the branches in great abundance, and when they have acquired the bright yellow colour characteristic of the ripe condition, there are few of our smaller trees that make so charming an autumn picture. Among the specimens in the Kew herbarium there is one from a tree grown in the Arboretum which has the general appearance of the Ringo, but has leaves that, when mature, become glabrous beneath. Koehne has described, as *P. Ringo fastigiata bifera*, another variety characterised by a pyramidal habit, and, as regards a form with more glabrous leaves than usual, suggests that the peculiarity may be due to the presence of a strain of *P. prunifolia.* He describes also a hybrid between *P. Ringo* and *P. spectabilis.*

The Ringo requires no special soil or treatment, except that like other allied species it is subject to the attacks of "American Blight" (*Schizoneura lanigera*). This, however, is easily kept down by an occasional spraying with an emulsion of paraffin and soap.

Description.—*Tree*, of small size; young branches more or less tomentose, but soon becoming glabrous and dark brown. *Leaves* elliptic-ovate, rounded or shortly cuneate at the base, subacute or shortly acuminate, sharply crenate-serrate, 1½–4 in. long, 1–2½ in. wide, firm when mature, when young sparsely pilose, but soon becoming glabrous above, beneath more or less tomentose even when mature; petiole ⅖–¾ in. long, at length glabrous; stipules leafy, lanceolate. *Corymbs* sessile, 2–6-flowered; bracts woolly, subulate, pedicels 1–1¼ in. long, woolly tomentose, at length glabrous. *Receptacle* more or less villous, becoming glabrescent after the petals fall. *Calyx-lobes* linear-lanceolate, acuminate, 3–4 lin. long, villous on both faces. *Petals* wide elliptic, shortly clawed, nearly white when the flowers are fully open, reddish in bud. *Styles* villous at the base. *Fruit* ovoid, 1¼ in. long, 1 in. across, yellow, tipped by the persistent calyx.

Fig. 1, flowers; 2, fruit in longitudinal section:—*of natural size.*

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TAB. 8266.

MAHONIA ARGUTA.

Central America?

BERBERIDEAE. Tribe BERBEREAE.

MAHONIA, *Nutt.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 43 (*sub* Berberide); *Fedde in Engl. Bot. Jahrb.* vol. xxxi. 1901, p. 30; *Schneider, Ill. Handb. Laubholzk.* vol. i. p. 316.

Mahonia arguta, *Hutchinson in Gard. Chron.* 1908, vol. xliii. p. 82; affinis *M. paniculatae*, Oerst., sed foliolis angustioribus integris vel dentibus spinosis 1–5 munitis, reticulatione utrinque prominente, petalis minoribus differt.

Frutex, ramis glabris. *Folia* 4–6-juga, quam inflorescentia breviora; rhachides sulcatae 8–20 cm. longae; stipulae subulatae, 4–5 mm. longae; foliola lanceolata vel oblongo-lanceolata, subsessilia vel brevissime petiolulata, 2·5–9 cm. longa, 0·5–2 cm. lata, coriacea, spinoso-terminata, integra vel 1–5-spinoso-dentata, utrinque nitida, venis et venulis utrinque conspicuis. *Paniculae* ad apicem ramorum congestae, suberectae, laxae, 30–40 cm. longae, ramulis elongatis 3–4-floris rigidis compressis usque ad 4 cm. longis. *Bracteae* ramorum et pedicellorum ovato-lanceolatae, acutae, 2–4 mm. longae. *Sepala* 3 externa parva, elliptica, 3 mm. longa, 3-nervia; 3 intermedia et 3 interna oblongo-elliptica, 6 mm. longa, 3 mm. lata. *Petala* 6, oblonga, apice biloba, basi biglandulosa, 4 mm. longa, 3 mm. lata. *Stamina* 6; filamenta 2 mm. longa; antherae 1·5 mm. longae. *Ovarium* oblongum, 2 mm. longum. *Bacca* globosa, 6–8 mm. diametro, atro-coerulea.—J. HUTCHINSON.

A study of the careful revision by Dr. Fedde of the group of species to which the name *Mahonia* is popularly applied leaves little room for doubt that, from the scientific standpoint also, this group is more satisfactorily considered generically distinct from *Berberis* proper. The distinctions, as pointed out by Fedde, are that in *Berberis* the leaves are simple while the inflorescence springs from the axil of a leaf-thorn, whereas in *Mahonia* the leaves are compound and the inflorescence arises from the axil of a winter bud-scale. *M. arguta*, the species now dealt with, is most nearly allied to *M. paniculata*, but is readily distinguished by the narrower, entire or few-toothed leaflets which are more prominently veined on both surfaces, and by the smaller petals.

The plant from which our figure has been prepared had been in cultivation in a warm-house at Glasnevin for over thirty years, and had developed into a tall lanky shrub with terminal leaf-tufts. Mr. Moore, to whom we are indebted for the material used, and for this information, has been unable to trace the history of the plant or to find any clue to its native country, but from the fact that the more nearly allied forms are all natives of Central America, where they occur on the slopes of volcanic mountains in Guatemala and Costa Rica at altitudes of from 8,000 to 12,000 ft., it is possible that *M. arguta* may also have originally been obtained from this region. In 1906 the plant was removed to a cool airy house, and during the summer was placed out of doors, being again brought under glass in October. It responded to the new treatment by flowering in May, 1907, and again in 1908 as a result of a repetition of the treatment of wintering in a cool airy house and plunging in the open air during summer. Potted in good heavy loam with a little sand the plant is now healthy in appearance and is making vigorous growth. It is, indeed, possible that in the milder parts of Ireland and in the south-west of England the species may prove to be hardy.

DESCRIPTION.—*Shrub*, branches glabrous. *Leaves* 4–6-jugate, shorter than the inflorescence; leaf-rachis sulcate, 3–8 in. long; stipules subulate, about 2 lin. long; leaflets lanceolate or oblong-lanceolate, subsessile or shortly stalked, 1–3½ in. long, ⅕–¾ in. wide, coriaceous, spine-tipped, entire or with 1–5 spinescent teeth, shining on both surfaces and with conspicuous secondary nerves and veins. *Panicles* clustered at the tips of the branches, suberect, lax, 12–16 in. long, with elongated 3–4-flowered, rigid, compressed branchlets 1–1½ in. long; bracts ovate-lanceolate, acute, 1–2 lin. long. *Sepals*, three outer small, elliptic, 3-nerved, 1½ lin. long, three intermediate and three inner oblong-elliptic, 3 lin. long, 1½ lin. wide. *Petals* 6, oblong, with 2-lobed tips, 2-glandular at base, 2 lin. long, 1½ lin. wide. *Stamens* 6; filaments 1 lin. long; anthers rather shorter. *Ovary* oblong, 1 lin. long. *Berry* globose, ¼–⅓ in. across, dark blue.

Fig. 1, flower; 2, petal and stamen; 3, petal; 4, stamen; 5, pistil:—*all enlarged.*

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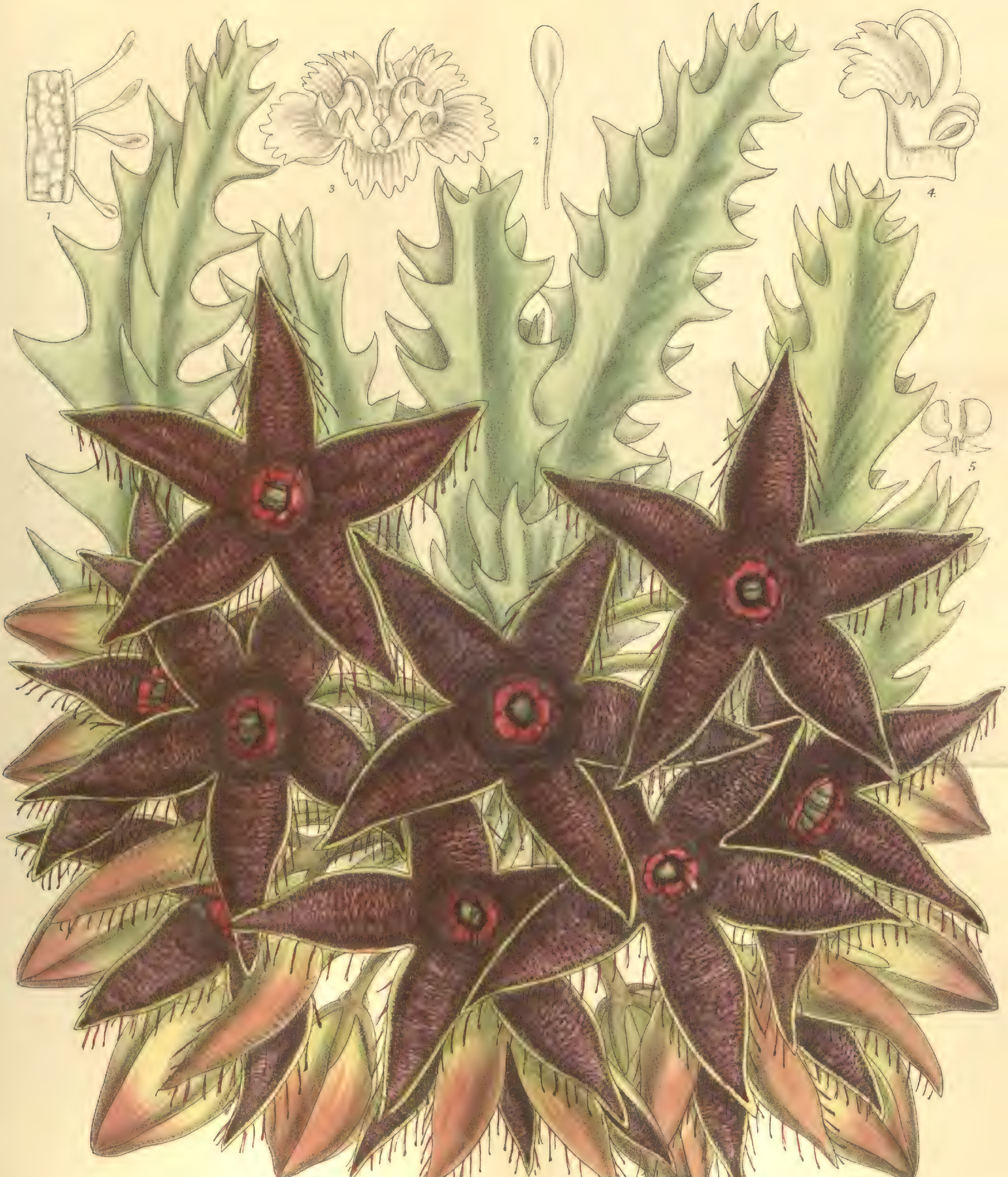

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TAB. 8267.

CARALLUMA NEBROWNII.

German South-west Africa.

ASCLEPIADACEAE. Tribe CEROPEGIEAE.

CARALLUMA, *R. Br.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 782.

Caralluma Nebrownii, *Berger in Notizbl. Bot. Gart. Berlin*, vol. iv. p. 249; species *C. lateritiae*, N. E. Br., affinis, a qua pedicellis multo longioribus corolla intense atro-kermesina rugosiore et coronae lobis majoribus differt.

Caules succulenti, aphylli, subconferti, erecti, tetragoni, grosse dentati, 8–15 (vel interdum ad 25) cm. alti, 1·8–3 cm. (dentibus exclusis) crassi, glabri, virides vel purpureo-maculati. *Flores* prope basin ramorum fasciculati. *Pedicelli* 4–9 cm. longi, 4–5 mm. crassi, glabri. *Sepala* 7–8 mm. longa, ovato-lanceolata, acuminata, glabra. *Corolla* rotata, 9–11 cm. diametro, extra laevis, rubro-purpurea, intra granulato-rugosa, intense atro-kermesina punctis parvis luteis disco et basi loborum maculata, glabra nisi lobis pilis longis clavatis ad apicem parce ciliatis; discus leviter depressus; lobi 3·6–4·3 cm. longi, 1·7–1·9 cm. lati, lanceolati, acuminati, basi subplani, superne marginibus recurvis. *Corona exterior* cupularis, profunde 5-loba, atrata vel atro-brunnea; lobi 3 mm. longi, 4–5 mm. lati, transverse rectangulari, apice dentati. *Coronae interioris* lobi inaequaliter bicornuti, cum corona exteriore dorsaliter connexi, atro-brunnei, cornubus interioribus 4 mm. longis subulatis erectis apice recurvis, exterioribus 0·5–1·5 mm. longis dentiformibus vel subulatis erectis.—N. E. BROWN.

Caralluma Nebrownii is one of the largest-flowered species in the genus, and is most nearly related to *C. lateritia*, N. E. Br., a native of the northern Kalahari desert, from which the plant now figured differs in having much longer pedicels, a more rugose corolla of a blackish-crimson colour flecked with very small yellowish spots on the disk and at the base of the lobes instead of a uniform brick red; the corona in the present plant is also larger than that of *C. lateritia*. *C. Nebrownii* is allied also to *C. huillensis*, Hiern, an Angolan species, and to *C. lutea*, N. E. Br., a species from South Africa. In both of these plants the pedicels are shorter than in the subject of our plate; *C. huillensis* has moreover pubescent stems, while in *C. lutea* the flowers are yellow and the stems have a different facies.

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The species now described was discovered by Mr. Dinter near Barmen in German South-west Africa (*Dinter*, n. 1502). Living plants sent by him to the late Sir Thomas Hanbury at La Mortola flowered there in July, 1907, and again in November, 1908, when the specimens from which our drawing was prepared were forwarded to Kew. The plant calls for very dry treatment, more especially in winter, when little or no water should be given to it.

Description.—*Herb*; stems succulent, leafless, somewhat clustered, erect, 4-angled, the angles coarsely toothed, usually 3–6, occasionally 10 in. in height, $\frac{3}{4}$–$1\frac{1}{4}$ in. thick not including the teeth, glabrous, green or blotched with purple. *Flowers* fascicled near the bases of the branches; pedicels $1\frac{1}{2}$–$3\frac{1}{2}$ in. long, 2–3 lines thick, glabrous. *Sepals* $\frac{1}{4}$–$\frac{1}{3}$ in. long, ovate-lanceolate, acuminate, glabrous. *Corolla* rotate, $3\frac{1}{2}$–$4\frac{1}{2}$ in. across, smooth and reddish-purple outside, within rugose-granular and deep blackish-crimson with some small yellow specks on the disk and at the base of the lobes, sparsely beset with long clavate hairs along the lobes, otherwise glabrous; disk slightly depressed; lobes $1\frac{1}{4}$–$1\frac{3}{4}$ in. long, $\frac{2}{3}$–$\frac{3}{4}$ in. across, lanceolate, acuminate, almost flat at the base, with the margins higher up somewhat recurved. *Outer corona* cupular, deeply 5-lobed, blackish or blackish-brown, the lobes $1\frac{1}{2}$ lin. long, 2–$2\frac{1}{2}$ lin. wide, toothed at the tip, transversely rectangular. *Inner corona* with unequally 2-horned lobes, dorsally united to the outer corona, blackish-brown, the inner horns 2 lin. long, subulate, erect and recurved at the tip, the outer under a line long, erect subulate or tooth-like.

Fig. 1, margin of corolla-lobe with four vibratile hairs; 2, a vibratile hair; 3, the entire corona; 4, a stamen, with one of the inner corona-lobes, showing its attachment to a lobe of the outer corona; 5, pollen-masses:—*all enlarged.*

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[illegible]

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TAB. 8268.

CYCNOCHES DENSIFLORUM.

Colombia.

ORCHIDACEAE. Tribe VANDEAE.

CYCNOCHES, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 552.

Cycnoches densiflorum, *Rolfe in Kew Bull.* 1909, p. 63; *Orch. Rev.* 1909, p. 104, fig. 9; a *C. Rossiano,* Rolfe, racemis masculis multo brevioribus et densifloris diversum.

Herba, pseudobulbi erecti, teretes, circa 15 cm. longi, vaginis membranaceis vestiti. *Folia* oblongo-lanceolata, acuta vel acuminata, recurva, subundulata, circa 12–16 cm. longa, 3–4 cm. lata. *Flores* monoici. *Racemi masculi* penduli, multiflori, densiflori, circa 35 cm. longi. *Bracteae* lanceolatae, acuminatae, membranaceae, circa 1 cm. longae. *Pedicelli* graciles, circa 2 cm. longi. *Sepala* et *petala* membranacea, oblongo-lanceolata, subacuta, recurva, viridia purpureo-maculata, 2–2·5 cm. longa. *Labellum* unguiculatum, circa 1·5 cm. longum; lamina cochlearis, apice longe acuminata, margine digitis clavatis vel capitatis utrinque instructa. *Columna* gracilis, incurva, 2·5 cm. longa. *Racemi feminei* suberecti, breves, biflori, circa 5 cm. longi. *Bracteae* oblongo-lanceolatae, acutae, circa 1·7 cm. longae. *Pedicelli* crassi, arcuati, circa 4 cm. longi. *Sepala* et *petala* carnosula, patentia, oblonga, acuta, viridia, 3·5–4·5 cm. longa. *Labellum* breviter unguiculatum, ovatum, acutum, integrum, crassocarnosum, eburneum, 3 cm. longum, 2 cm. latum, basi callo transverso instructum. *Columna* crassa, clavata, incurva, circa 1·3 cm. longa.—*C. maculatum,* Gard. Chron. 1909, vol. xlv. pp. 26, 27, fig. 19; non Lindl.—R. A. ROLFE.

This remarkable Colombian orchid flowered in the collection of the Rev. J. C. B. Fletcher, Mundham Vicarage, Chichester, in November, 1908, shortly after having been obtained from Messrs. Hugh Low & Co. It appeared unexpectedly among some species of *Mormodes* collected at Simacota, near the River Opon, Colombia, by Mr. J. Birchenall. It is interesting on account of the great diversity between the sexes, which, as in the present instance, are occasionally borne together upon the same pseudobulb, the females being many times larger and heavier than the males, and different not only in the shape of the sexual organs, but also in the shape, texture and colour of the perianth. The column of the male is long and slender, bearing the anther at the summit, while in

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the female it is very short and stout, with a pair of triangular fleshy wings at the sides of the stigma. The lip in the female is a large, ovate, fleshy body, but in the male it is reduced to a small circular disk, surrounded by a number of clavate marginal appendages. The sepals and petals are membranous in the males, and very fleshy in the females; the differences in size and colour are well shown in the figure. These differences do not extend equally to every species in the genus, nor were they known to be differences of sex until comparatively recently, as may be seen by the account given at plate 4054 of this work. The history of the genus has been reviewed by Mr. Rolfe in a recent paper in the Kew Bulletin for 1909 (pp. 268–277).

Description.—*Herb*, with erect terete pseudobulbs about 6 in. high, clothed with membranous scales. *Leaves* oblong-lanceolate, acute or acuminate, recurved, somewhat undulate, about 5–7 in. long, 1–$1\frac{1}{2}$ in. wide. *Flowers* monoecious. *Male racemes* pendulous, many- and dense-flowered, about 14 in. long; bracts lanceolate, acuminate, membranous, about $\frac{1}{3}$ in. long; pedicels slender, about $\frac{3}{4}$ in. long. *Sepals* and *petals* of male flowers membranous, oblong-lanceolate, subacute, recurved, greenish with purple blotches, $\frac{3}{4}$–1 in. long. *Lip* of male flowers clawed, about $\frac{3}{5}$ in. long; the lamina cochleate, long acuminate, its margin beset with a fringe of clavate or capitate processes. *Column* of male flowers slender, incurved, 1 in. long. *Female racemes* short, suberect, 2-flowered, about 2 in. long; bracts oblong-lanceolate, acute, about $\frac{2}{3}$ in. long; pedicels stout, curved, about $1\frac{1}{2}$ in. long. *Sepals* and *petals* of female flowers almost fleshy, spreading, oblong, acute, green, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long. *Lip* of female flowers clawed, ovate, acute, entire, thick and fleshy, ivory-white, $1\frac{1}{4}$ in. long, $\frac{3}{4}$ in. wide, with a transverse basal callus. *Column* of female flowers thick, clavate, incurved, about $\frac{1}{2}$ in. long.

Fig. 1, a leaf; 2, a male inflorescence; 3, a female flower; 4, lip of male flower; 5, column of male flower; 6, sketch of an entire plant:—1–3 *of natural size*, 4 *and* 5 *enlarged*, 6 *much reduced.*

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TAB. 8269.

ERLANGEA TOMENTOSA.

Tropical East Africa.

COMPOSITAE. Tribe VERNONIEAE.

ERLANGEA, *Sch.-Bip.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 225.

Erlangea tomentosa, *S. Moore in Journ. Bot.* vol. xlvi. p. 158; species *E. fuscae*, S. Moore, affinis sed foliis supra viridibus, cymis tomentosis, involucri bracteis marginibus scariosis differt.

Frutex, ultra 1 m. alta, ramis sulcatis parce villoso-tomentosis, ramulis dense villoso-tomentosis. *Folia* oblonga vel oblongo-lanceolata, basi leviter rotundata vel cuneata, subacuta, 5–13 cm. longa, 2–4·5 cm. lata, duplo-serrata, membranacea, supra pubescentia, subtus villoso-tomentosa, nervis lateralibus utrinque 8–13 subtus conspicuis; petioli usque ad 3 cm. longi. *Panicula* capitulorum laxe subcorymbosa, circiter 14 cm. diametro. *Capitula* campanulata 1 cm. diametro, lilacina. *Pedunculi* usque ad 6 cm. longi. *Involucri bracteae* 3-4-seriatae, elliptico-ovatae vel lanceolatae, acutae vel subacutae, 3–5 mm. longae, 1–2 mm. latae, marginibus scariosis, extra villoso-tomentosae. *Corollae* tubus ultra medium leviter ampliatus, arcuatus, 4 mm. longus, lobis lanceolatis 2 mm. longis. *Achaenia* subturbinata, 1 mm. longa, glabra. *Pappi setae* circiter 2 mm. longae, caducissimae.—*Bothriocline Schimperi*, var. *tomentosa*, Oliv. et Hiern in Fl. Trop. Afr. vol. iii. p. 266.—J. HUTCHINSON.

The subject of our plate appears to be a somewhat polymorphic species which is rather widely spread in Tropical Africa from British East Africa to the Zambesi. The genus *Erlangea*, to which Mr. Moore has referred it, differs from the genus *Vernonia* only in respect of its reduced achenes, and in having the pappus reduced to a few short, very caducous hairs. Till a few years ago it was deemed a monotypic group; now it is believed to consist of at least thirty-two species, several of which, however, had formerly been included in *Vernonia*. With the exception of a single species from New Guinea which has been referred to this genus all the Erlangeas are African. The nearest ally of *E. tomentosa* is *E. fusca*, S. Moore, from which, as Mr. Hutchinson points out, it is readily distinguished by the bright green leaves and the scariously edged involucral bracts.

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The plant from which the figure now given has been prepared was presented to Kew in April, 1907, by Mr. R. Diespecker, Adstock House, Winslow, who had raised it from seed received from British East Africa. It has formed a shrub, in habit much resembling some of the Eupatoriums, attaining a height of 5 ft.; it flowers freely and continuously during winter and spring. It admits of easy cultivation in a green-house, and requires the treatment most suitable for the winter-flowering species of *Eupatorium*.

DESCRIPTION.—*Shrub*, attaining a height of 5 ft., branches furrowed and sparingly villous, branchlets densely villous-tomentose. *Leaves* oblong or oblong-lanceolate, base cuneate or slightly rounded, apex subacute, 2–5 in. long, $\frac{3}{4}$–1$\frac{3}{4}$ in. wide, doubly serrate, membranous, pubescent above, villous-tomentose beneath, nerves 8–13 on each side, prominent beneath; petioles 1–1$\frac{1}{4}$ in. long. *Heads* lilac, campanulate, each about $\frac{2}{5}$ in. wide, arranged in lax, almost corymbose panicles which are about 6 in. across; peduncles 2–2$\frac{1}{2}$ in. long. *Bracts* of the involucre 3–4-seriate, from elliptic-ovate to lanceolate, acute or subacute, $\frac{1}{8}$–$\frac{1}{5}$ in. long, $\frac{1}{2}$–1 lin. wide, villous-tomentose outside, and with scarious edges. *Corolla* $\frac{1}{4}$ in. long, the tube curved and somewhat enlarged beyond the middle, 2 lin. long, the lanceolate lobes 1 lin. long. *Achenes* somewhat turbinate, $\frac{1}{2}$ lin. long, glabrous. *Pappus* composed of a few very caducous setae 1 lin. long.

Fig. 1, section of a capitulum; 2, flower; 3, pappus-seta; 4, stamens; 5, style:—*all enlarged.*

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TAB. 8270.

SPIRAEA HENRYI.

Central China.

ROSACEAE. Tribe SPIREAE.

SPIRAEA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 611.

Spiraea (Chamaedryon) Henryi, *Hemsl. in Journ. Linn. Soc. Bot.* vol. xxiii. p. 225, t. 6; *J. H. Veitch in Journ. Roy. Hort. Soc.* vol. xxviii. (1903) p. 61; species *S. canescenti*, D. Don, accedens sed foliis majoribus nec molliter tomentosis facillime distinguenda; *S. pubescenti*, Turcz., similior sed corymbis compositis statim distincta; *S. Wilsoni*, Duthie, proxima sed pedunculis pedicellisque pilosis differt.

Frutex, laxe patuleque ramosissimus, 1·75–2 m. altus, ramulis foliiferis annotinis parce pilosis, demum glabrescentibus vel glabris, ramulis floriferis graciliusculis glabrescentibus. *Folia* in ramis haud floriferis 6–9 cm. longa, breviter petiolata, oblanceolata, supra glabra vel parce pilosa, subtus pubescentia, subcoriacea, supra medium 3–7-dentata, ceterum integra; in ramis floriferis minora, 2–4 cm. longa, obovata vel oblonga interdum truncata apice saepius 3–7-dentata nonnunquam integra. *Flores* mediocres 6–7 mm. lati, in corymbis compositis 5 cm. latis, ramulos breves ramorum anni praecedentis terminantibus; pedunculi pedicellique pilosi. *Petala* orbicularia, alba. *Calyx* 5-lobatus, lobis triangulis integris mucronulatis. *Ovaria* parce pilosa, 2-ovulata. *Fructus* in corymbis dispositi; carpella 5, matura 3 mm. longa, membranacea, latere ventrali dehiscentia.—W. J. BEAN.

Spiraea Henryi was discovered by Mr. A. Henry in Hupeh, near Ichang, in 1885, and later in Szechuen, but for its introduction to cultivation our gardens are indebted to Messrs. J. Veitch & Sons of Chelsea, whose collector, Mr. E. H. Wilson, found it in 1900, also in Hupeh. It belongs to the section *Chamaedryon* (Ser. in DC. Prodr. ii. p. 542), and, like many of its allies, is a very charming acquisition. Among older species it is most closely related to *S. canescens*, D. Don, and its flowers, as in that species, are arranged in rounded corymbs on the upper side of long arching branches; its nearest ally is, however, *S. Wilsoni*, Duthie (Hort. Veitch. p. 379), which is also described as having the peduncles and pedicels covered with silky hairs, but is in reality almost glabrous. In mid-June, 1908, it was one of the most beautiful deciduous shrubs in flower at Kew. Mr. Henry observes that its leaves are used by the poorer natives as a substitute for tea.

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The plant from which our figure was taken was obtained from Messrs. Veitch in 1905. Since then it has grown excellently in a border of loamy soil, and is now a bush 7 ft. high and 10 ft. in diameter. Having passed through the winter of 1908–9 without any injury, the species may be regarded as absolutely hardy. It can be increased by means of cuttings made from half-ripened wood. From the cultivator's point of view, shrubby Spiraeas may be divided into two great groups, viz. those that blossom on the shoots of the current year, and those that do so on the shoots of the previous one. *S. Henryi* belongs to the latter. Whatever pruning, therefore, may be necessary, should be done as soon as the flowers are past, and it should be a process of thinning out rather than a general shortening back of the branches, the leading idea being to produce long, uncrowded branches, and, by preserving a loose, open habit, thereby to display to the best advantage the numerous white corymbs with which they will in due time be garnished.

DESCRIPTION.—*Shrub*, of lax, spreading habit, 7 to 8 ft., or perhaps more, high; branches sparsely pilose the first season, glabrous or nearly so the second. *Leaves* on the barren shoots 2½–3½ in. long, oblanceolate, glabrous or slightly pilose above, tomentose beneath, coarsely dentate near the apex; those of the flowering shoots smaller, ¾–1½ in. long, obovate or oblong, usually with three to seven teeth at the apex, but occasionally entire. *Flowers* ¼ in. in diameter, produced in compound corymbs 2 in. across, which are terminal on short twigs springing from the branches of the previous year; peduncles and pedicels pilose. *Petals* white, orbicular. *Calyx* with five triangular lobes. *Ovary* pilose, two-ovuled. *Fruit* in corymbs; carpels 5, ⅛ in. long when mature, membranaceous, dehiscing ventrally.

Fig. 1, flower; 2, section of ditto, petals removed; 3, carpel; 4, fruit; 5, single fruit:—*all except* 4 *enlarged.*

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TAB. 8271.

AGAVE WRIGHTII.

Central America.

AMARYLLIDACEAE. Tribe AGAVEAE.

AGAVE, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 738.

Agave (Littaea) Wrightii, *J. R. Drumm.*; species e grege *A. geminiflorae*, Scannag., a qua foliis subulatis nec super basem linearibus angusteque loratis et laevigatis nec sulcato-striatis, perigoniique lobis haud purpurascentibus conspicue differt; *A. angustissimae*, Engelm., et *A. Knightianae*, J. R. Drumm., maxime affinis; ab illa ob foliorum basem in pulvinum valde incrassatum, partem vero apicalem ad marginem utramque canaliculatam et antheras aureas nec purpureas distinguenda; a hac filamentis haud coloratis, foliorumque basi latiore magis gibboso recedit.

Truncus perbrevis, foliis numerosis modice congestis rosulatim dispositis vestitus. *Folia* carnoso-coriacea, subulata, 40–45 cm. longa, basi primum tenui lateraliter dilatato mox antice gibboso, postice leviter excavato, ultimum in pulvinum obliquum expanso, ad 3 cm. ultra imam basem in collum contracta, dein ad apicem argutissimum in spinam vix 1 cm. longam abeuntem attenuata; ima basi 3·5 cm., pulvini medio fere 4 cm., collo 2·25 cm., laminae verae medio vix 0·5 cm. lata; pulvini medio 2·5 cm., collo 1·5 cm., laminae verae medio vix 2 mm. crassa; facie anteriora subcarinate convexa, obtuse et irregulariter pauci-sulcata, facie posteriore primum carinate convexa mox propter laminae margines plus minusve involutas mediumque simulac obtuse costatum versus marginem utramque canaliculata; utrinque laevigata, laete viridia sed maculis minutis albidis numerosis notata; ipsis marginibus subcorneis subfulvidis primum integris per aetatem in filamentis paucis remotioribus dilacerata. *Scapus* ad 3 m. altus, pedunculo 1 m. longo bracteis subscariosis tunc acicularibus 6–9 cm. longis instructo. *Flores* geminati in spicam 2 m. longam digesti; pedicelli doliiformes, perbreves. *Perigonii* lobi margine pallide lactei, ceterum viridescentes, ultra 1·5 cm. longi, 6 mm. lati, medio subcarinati; perigonii tubus 1·25 cm. longus, inferne parum constrictus ibique 0·25 cm. latus. *Stamina* fere recta, 6 cm. longa, filamentis albidis, antheris luteis basi demum 2-fidis. *Ovarium* 1·25 cm. longum; stylus 6 cm. longus.—J. R. DRUMMOND.

The subject of our plate is a member of the *Littaea* section of *Agave* and is allied to *A. geminiflora*, Scannag. (*Littaea geminiflora*, Tagliabue), the species on which the genus *Littaea* was originally based. The plant now figured was acquired for Kew from the collection of Mr. T. H. Kellock in 1903 under the name *A. Taylori*. That it is not the true *A. Taylori*, Hort. Williams (Gard. Chron. 1874, vol. i. p. 418)—which is stated (Gard. Chron. 1877, vol. viii. p. 621,

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fig. 125, and Baker, Handb. Amaryllid. p. 186) to be a garden hybrid whereof *A. geminiflora* is one parent and *A. filamentosa* is probably the other—was at once recognised, and our plant was therefore tentatively treated as possibly a variant of *A. geminiflora* until it flowered in the Mexican House at Kew in November, 1908. Mr. C. H. Wright, by whom the plant was then examined, found it to differ from *A. geminiflora* in the colour of its flowers as well as in its leaves, which are smooth and subulate in place of being narrowly loriform and striate. It appeared to Mr. Wright that its nearest ally is *A. angustissima*, Engelm., first named, but not then fully characterised (Trans. St. Louis Acad. Sc. vol. iii. p. 306) in 1876, but that it is specifically distinct from Engelmann's plant. A comparison with specimens to which Dr. Trelease has attached the name *A. angustissima*, and a study of the figure and description of that species supplied by Dr. J. N. Rose (Garden and Forest, vol. iii. pp. 5 and 6) in 1893 have satisfied Mr. Drummond that Mr. Wright's conclusions are justified. Though allied to *A. angustissima*, *A. Wrightii* differs from that plant by the shorter, less constricted perianth-tube, by the yellow in place of purple anthers, by the less flattened leaf-blade which has the upper face channelled inside either margin, by the broader leaf-neck and by the much wider and much more abruptly shouldered leaf-base. As regards floral structure, Mr. Drummond points out that *A. Wrightii* approaches most closely to the plant figured as *A. geminiflora* (Bot. Reg. t. 1145) in 1828; from that plant *A. Wrightii* is readily distinguished by its much wider and more gibbous leaf-base; but, except in having white in place of coloured filaments, hardly differs as regards flowers. The plant thus depicted by Lindley is not, however, *A. geminiflora*, Scannag., and to distinguish it Mr. Drummond suggests the employment of the name *A. Knightiana*. It may be added that this species has remained not only unnamed, but undescribed, for the description associated with it in the Botanical Register has not been based on, and does not apply to, the plant there figured, but has been taken, unmodified, from the reprint in the second volume of the Journal of Science (1817) of the original account of *Littaea geminiflora* published by Tagliabue (Bibl. Ital. vol. i. p. 9) in 1816.

DESCRIPTION.—*Trunk* short, hidden by the rather close rosette. *Leaves* between fleshy and leathery, somewhat flexible, more or less erect when young, at length drooping, 16–18 in. long, tapering evenly to a fine point tipped with a short stoutish spine, from a gibbous base $1\frac{1}{6}$ in. wide at its origin, $1\frac{1}{3}$ in. wide at the shoulder whence it is gradually rounded to the unconstricted neck, nearly 1 in. thick; lower surface uniformly triangular-convex, bluntly keeled with a few irregular blunt creases; upper surface for about $4\frac{1}{2}$ in. above the neck depressed-convex with a blunt somewhat obliquely placed keel, above shallowly channelled with a rounded ultimately obsolete central ridge; smooth and dull apple-green flecked with minute white spots on both surfaces; margins sharp without teeth or prickles, but with a fine horny border ultimately shredding into hair-like whitish filaments. *Scape* about 10 ft. high, peduncular portion about 3 ft. long, with involute acicular more or less scarious bracts about $2\frac{3}{4}$ in. long gradually diminishing from the base upwards. *Flowers* in pairs arranged in a rather dense spike about 7 ft. long, on very short barrel-shaped pedicels, bracteolate. *Perianth* lobes about 8 lin. long, 3 lin. wide, revolute, dark green with creamy-white borders; tube 5–6 lin. long, little constricted. *Stamens* subulate; filaments almost colourless, nearly $2\frac{1}{2}$ in. long; anthers bright yellow, their cells at length free at the base. *Ovary* cylindric, 5–6 lin. long; style $2\frac{1}{4}$ in. long.

Figs. 1 and 2, anthers; 3, apex of style, and stigma; 4, sketch of entire plant, showing habit:—1–3 *enlarged*, 4 *much reduced*.

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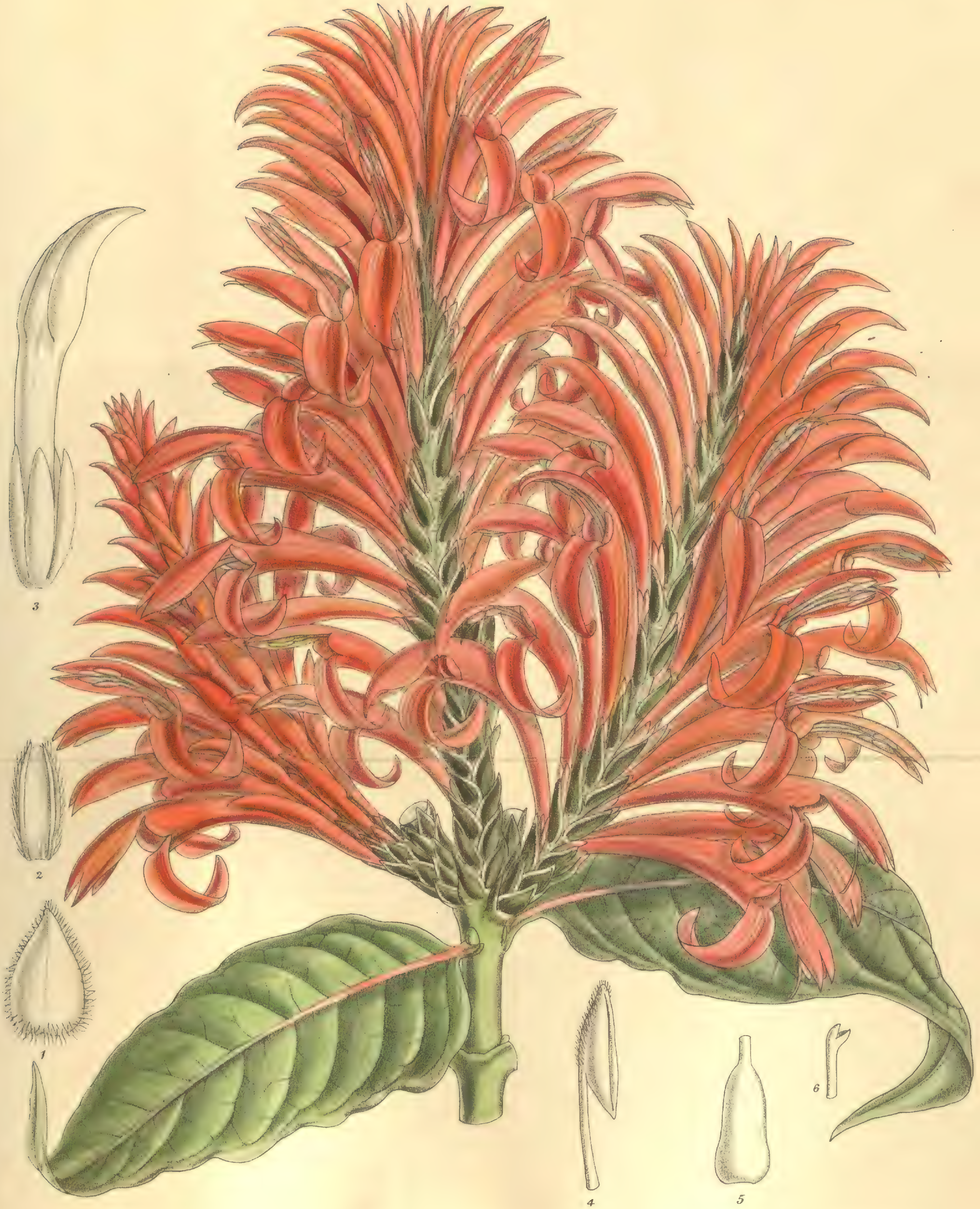

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TAB. 8272.

APHELANDRA TETRAGONA.

Tropical South America.

ACANTHACEAE. Tribe APHELANDREAE.

APHELANDRA, *R. Br.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1102.

Aphelandra tetragona, *Nees in DC. Prodr.* vol. xi. p. 295; ab *A. pulcherrima,* Kunth, quacum olim confusa erat, foliis basi minus decurrentibus subtus parce pubescentibus vel fere glabris, minime tomentosis, corollis majoribus distincta.

Frutícans ramis teretibus fistulosis ad 1 cm. crassis glabris. *Folia* ovato-lanceolata vel late ovato-elliptica, basi lata et breviter cuneatim decurrentia vel cuneatim attenuata, apice longiuscula vel breviter acuminata, margine leviter undulato-crenata, 20–25 cm. longa, 10–15 cm. lata, papyracea, supra glabra, infra in gemma albido-pubescentia, citissime glabrescentia; petiolus 4–5 cm. longus. *Spicae* ad apices ramorum 1–3–5-nae, terminalis ad 15 cm. longa, corollis demptis 1 cm. crassae, densissimae; bracteae ovatae, acutae vel subacuminatae, 10–12 mm. longae, viridi-brunnescentes, subcoriaceae, ima basi albo-lanatae, secundum margines villoso-ciliatae, caeterum glabrae, inferne prominule-striatae, glandulis obscuris; bracteolae lanceolatae, albo-villosae, 1 cm. longae. *Sepala* scariosa, lanceolata, acuta, 13 mm. longa, apice subvillosa. *Corolla* pulcherrime coccinea, puberula; tubus supra basin constrictus, deinde sensim ad os ampliatus, hic circiter 6–8 mm. latus; labium superum 2 cm. longum, bifidum, lobis acutissimis 6 mm. longis; labium inferum ex ovato longe attenuatum, 22–24 mm. longum, explanatum 9 mm. latum, lobis lateralibus ad marginem 2 mm. latum superne in dentulum productum redactis. *Antherae* 7 mm. longae, in dorso minute pilosulae.—*A. tetragona,* var. *imperialis,* Wittmack in Gartenflora, vol. xl. p. 449, t. 1354. *Justicia tetragona,* Vahl. Symb. vol. iii. p. 5. *J. cristata,* Jacq. Hort. Schoenbr. vol. iii. p. 38, t. 320.—O. STAPF.

Aphelandra tetragona, as here figured, is a native of Guiana and Venezuela, which has long been in cultivation at Kew. It is, without doubt, the species described by Vahl in 1794 as *Justicia tetragona,* from specimens collected by Dr. Rohr near Cayenne, and is exactly the plant figured by Jacquin in 1798 as *Justicia cristata,* though it is somewhat uncertain as to whether it be the plant figured as *Aphelandra cristata* at t. 1578 of this work. The plant represented on that plate agrees precisely with specimens from Trinidad, Tobago and British Guiana, all of which have bracts that are only half the size of those in the plant now depicted, have quite short flowering spikes and have uniformly smaller leaves.

At Kew *A. tetragona* is grown in a tropical house. It flowers at various seasons according to the age of the plant and the treatment it is given; the plant from which the present figure was made flowered in September, 1908, but an even finer example came into flower in May, 1909, the head of flowers, borne on a single stem nearly 4 ft. high, consisting of 13 spikes, each from 4–7 in. long. The plant in question was two years old, and had been raised from a cutting; older plants do not flower so well. A rich loamy soil and an abundant supply of water at the roots, with a tropical temperature, are the most suitable conditions.

DESCRIPTION.—*Shrubby*; branches round, hollow, smooth, up to $\frac{2}{5}$ in. thick. *Leaves* ovate-lanceolate to widely ovate-elliptic, abruptly narrowed to a cuneate or decurrent base, apex shortly or considerably acuminate, margin faintly undulate-crenate, 8–10 in. long, 4–6 in. wide, papery, glabrous above, whitish pubescent in bud, but soon becomes glabrous beneath; petiole $1\frac{3}{4}$–2 in. long. *Spikes* usually 3–5-nate, occasionally solitary, rarely 9–13-nate at the ends of the branches, the terminal 6–7 in. long, $\frac{2}{5}$ in. thick without the corollas, very dense; bracts ovate, acute or subacuminate, 5–6 lin. long, greenish-brown, firm, woolly white at the base and villous along the margins, elsewhere glabrous, markedly striate below, faintly glandular; bracteoles lanceolate, white villous, 5 lin. long. *Sepals* scarious, lanceolate, acute, $\frac{1}{2}$ in. long, slightly villous at the tips. *Corolla* brilliant pink, puberulous; tube narrowed above the base, thence gradually widening to the limb and there 3–4 lin. wide; upper lip $\frac{3}{4}$ in. long, bifid, lobes acute, 3 lin. long; lower lip gradually narrowed from a wide limb, $\frac{4}{5}$–1 in. long, 4–5 lin. wide, the lateral lobes reduced to a margin 1 lin. wide, ending upwards in a small tooth. *Anthers* 3–4 lin. long, finely pilose on the back.

Fig. 1, bract; 2, bracteole; 3, flower; 4, anther; 5, ovary; 6, stigma:—*all enlarged.*

M.S. del. J.N.Fitch lith.

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Tab. 8273.

MEGACLINIUM purpureorachis.

Congo.

Orchidaceae. Tribe Epidendreae.

Megaclinium, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 505.

Megaclinium purpureorachis, *Wildem. Not. Pl. Utiles, Congo*, p. 126; *Études Fl. Bas et Moyen Congo*, vol. i. pp. 116, 235, t. 29; *Rolfe in Orch. Rev.* 1909, p. 155; *Gard. Chron.* 1909, vol. xlv. p. 293, fig. 126; a *M. maximo*, Lindl., foliis et rhachi fere duplo latioribus et floribus scabrido-velutinis distinctum.

Herba epiphytica, rhizomate crasso lignoso. *Pseudobulbi* elliptico-oblongi, subcompressi, 6–8 cm. longi, 2·5–3·5 cm. lati, diphylli, basi vaginis ovatis conduplicatis membranaceis striatis obtecti. *Folia* subsessilia, oblonga vel elliptico-oblonga, subobtusa, coriacea, 20–30 cm. longa, 4–5 cm. lata, subtus minute nigro-puncticulata. *Scapi* laterales, validi, suberecti, 30–35 cm. longi, basi vaginis ochreatis numerosis obtecti; rhachis complanatus, latus, subtortus, undulatus, copiose purpureo-punctatus, scabrido-puberulus, 15–20 cm. longus, 3–4 cm. latus, multiflorus; bracteae ovatae vel ovato-oblongae, apiculatae vel acuminatae, apice recurvae, basi utrinque transverse decurrentes, 8–10 mm. longae; pedicelli circa 4 mm longi. *Flores* brunnei, extus scabrido-velutini. *Sepalum* posticum ovato-oblongum, subacutum, concavum, incurvum, apice reflexum, circa 8 mm. longum; sepala lateralia obliqua, triangulari-ovata, acuminata, apice falcata, circa 8 mm. longa. *Petala* lineari-falcata, acuminata, 5–6 mm. longa; labellum orbiculari-ovatum; recurvum, obtusum, complanatum, 4 mm. longum. *Columna* lata, 4 mm. longa; dentes validi, apice bidentati. *Capsulae* oblongae, circa 2·5 cm. longae.—*M. Bufo*, Hort., Gard. Chron. 1909, vol. xlv. p. 239; non Lindl.—R. A. Rolfe.

Megaclinium purpureorachis, much the largest species of this genus yet known, was first met with by Mr. Gentil on the Upper Lomami, a tributary of the Congo, in January, 1903, and was described and figured by Professor de Wildeman from fruiting specimens. The flowers remained unknown until September, 1908, when the plant from which our plate has been prepared came into flower at the Royal Botanic Garden, Glasnevin, whence material was supplied by Mr. Moore. A plant was subsequently exhibited by Sir Trevor Lawrence, Bart., at a meeting of the Royal Horticultural Society in April, 1909; in this instance under the name *M. Bufo*. It is, however, very different from the plant thus designated, which was

September, 1909.

described by Lindley from the inflorescence only, and which has recently reappeared in cultivation. The nearest ally of the plant now described is *M. maximum*, Lindl., a species figured at t. 5936 of this work under the name *M. marmoratum*, Lindl. The present species is readily distinguished from *M. maximum* by its considerably larger size and its very hairy brown flowers. Mr. Moore informs us that the plant from which our material was derived was obtained from Messrs. Sander and Sons in 1905; it thrives vigorously in an intermediate house, with a minimum night temperature of 55° F.; it requires light, and has to be grown close to the glass. The strong stiff rhizome does not bend readily; it is therefore advisable to grow the plant in fairly shallow pans rather than pots. A few chopped oak-leaves added to the compost appear to encourage growth.

Description.—*Herb*, epiphytic, rhizome stout, woody; pseudobulbs elliptic-oblong, somewhat flattened, 2½–3 in. long, 1–1½ in. wide, 2-foliate, the base clothed with membranous striate ovate conduplicate sheaths. *Leaves* subsessile, oblong or elliptic-oblong, rather obtuse, coriaceous, 8–12 in. long, 1½–2 in. wide, finely dark-punctate beneath. *Scapes* lateral, stout, suberect, 12–14 in. long, clothed at the base with numerous ochreate sheaths; rachis broad, flattened, undulate and slightly spirally twisted, freely dotted with purple spots and scabridly puberulous, 6–8 in. long, 1¼–1½ in. wide, many-flowered; bracts ovate or ovate-oblong, apiculate or acuminate, recurved at the tips, their bases transversely decurrent on both sides, 4–5 lin. long; pedicels about 2 lin. long. *Flowers* brown, scabridly velvety outside; posterior sepal ovate-oblong, subacute, concave, incurved with a reflexed tip, about 4 lin. long; lateral sepals oblique, triangular-ovate, acuminate, with their tips falcate, about 4 lin. long. *Petals* linear-falcate, acuminate, 2½–3 lin. long; lip orbicular-ovate, recurved, obtuse, flattened, 2 lin. long. *Column* broad, 2 lin. long; teeth distinct, 2-fid at the tip. *Capsule* oblong, about 1 in. long.

Fig. 1, a flower; 2, the same, sepals removed; 3, anther-cap; 4, pollinia:—*all enlarged.*

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TAB. 8274.

EXOSTEMMA SUBCORDATUM.

West Indies.

RUBIACEAE. Tribe CINCHONEAE.

EXOSTEMMA, *Rich.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 42.

Exostemma subcordatum, *Krug et Urban in Urb. Symb. Antill.* vol. i. p. 421; affinis *E. floribundo,* Roem. et Schult., sed foliis subcordatis calycisque segmentis longioribus differt.

Frutex, 2–3 m. altus (*Jacquemont*). *Rami* teretes, juniores brevissime vel minutissime puberuli, demum glabri, cortice cinereo. *Folia* ovata vel ovato-lanceolata, basi plus minusve subcordata, apice acuminata, 5–8 cm. longa, 2·5–4 cm. lata, margine revoluta, tenuiter coriacea, utrinque minutissime puberula, nervis lateralibus utrinque 6–8 supra impressis subtus elevatis; stipulae ovato-triangulares, acutae, 3 mm. longae. *Inflorescentia* terminalis, laxe subcorymbosa; ramuli puberuli; pedicelli 6–8 mm. longi, graciles; bracteae lineares vel subulatae. *Receptaculum* elongato-ellipsoideum, minute puberulum. *Calycis* segmenta linearia, obtusa vel subacuta, 5–8 mm. longa, fere glabra. *Corolla* alba; tubus anguste cylindricus, 1·5–2 cm. longus, extus glaber; lobi lineares, obtusi, circiter 2·5 cm. longi, 2 mm. lati. *Filamenta* filiformia 1·5 cm. longa; antherae exsertae, flavae, 1 cm. longae. *Stylus* exsertus, gracilis, 4–5 cm. longus, glaber; stigma ovoideum. *Fructus* oblongo-obovoideus, circiter 12 mm. longus, superne 5 mm. diametro.—J. HUTCHINSON.

The genus *Exostemma* includes nearly forty described species, whereof twenty are known to occur in the West Indies, chiefly in Cuba. *E. subcordatum*, the species now figured is, however, a native of San Domingo, and is met with in the more mountainous parts of that island. The plant from which our plate has been prepared was presented to Kew in 1903 by Professor Hansen, Director of the Botanic Gardens, Giessen, under the name *E. floribundum*, to which species it is indeed most nearly allied, but from which it chiefly differs, as Mr. Hutchinson points out, in having longer calyx-segments; from this and all other known species of the genus it is, moreover, readily distinguished by its subcordate leaves. Under cultivation the Kew plant has formed a loosely-growing shrub about 3 ft. high; it flowers freely in autumn, the flowers being pure white

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and very fragrant. It thrives well in a tropical house under the treatment suitable for Ixoras. Two other members of the genus are in cultivation; these are *E. caribaeum*, Roem. and Schult., and *E. longiflorum*, Roem. and Schult.; the latter has been figured at t. 4186 of this work.

DESCRIPTION.—*Shrub*, as grown at Kew about 3 ft. high, according to Jacquemont attaining in the wild state a height of 10 ft.; branches terete, when young shortly puberulous, at length becoming glabrous; bark grey. *Leaves* ovate or ovate-lanceolate, more or less subcordate at the base, acuminate at the apex, margin revolute, 2–3 in. long, 1–1½ in. wide, thinly leathery, finely puberulous above and below; lateral nerves 6–8-paired, somewhat depressed above, prominent beneath; stipules ovate-triangular, acute, 1½ lin. long. *Inflorescence* terminal, leafy, subcorymbose; branchlets puberulous; pedicels slender, 3–4 lin. long; bracts linear or subulate. *Receptacle* long ellipsoid, finely puberulous. *Calyx-lobes* linear, obtuse or subacute, 3–4 lin. long, almost glabrous. *Corolla* white, fragrant; tube narrowly cylindric, ½–¾ in. long, glabrous outside; lobes linear, obtuse, about 1 in. long, 1 lin. wide. *Stamens* far exserted; filaments filiform, 8 lin. long; anthers yellow, 5 lin. long. *Style* far exserted, slender, glabrous, 1¾–2 in. long; stigma ovoid. *Fruit* oblong-obovoid, nearly ½ in. long, about ⅕ in. wide at the apex.

Fig. 1, calyx and pistil; 2 and 3, anthers; 4, stigma:—*all enlarged.*

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TAB. 8275.

EUPHORBIA LEDIENII.

South Africa.

EUPHORBIACEAE. Tribe EUPHORBIEAE.

EUPHORBIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 258.

Euphorbia Ledienii, *Berger, Sukkulente Euphorb.* p. 80; affinis *E. coerulescenti*, Haw., sed ramis 5–7-angulatis remote et leviter (nec forte) constrictis et spinis minoribus facile distinguenda.

Frutex succulentus, ramosus, cito aphyllus, 1 m. vel ultra altus, omnino glaber. *Rami* acute 5–7-angulati, 3·5–5·8 cm. crassi, leviter constricti, constrictionibus 7·5–20 cm. distantibus; anguli ad acies haud vel leviter vel interrupte indurati; sulci inter angulos concavi. *Folia* minuta, squamiformia, 1 mm. longa, 2 mm. lata, late rotundata, evanida. *Spinae* binae, divergentes, 3–7 mm. longae, brunneae, demum cinereae, intervallis 1–2 cm. longis dispositae. *Cymae* involucra 3 gerentes, saepe plures in axilla singula aggregatae, brevissime pedunculatae. *Pedunculi* 2 mm. longi. *Bracteae* squamiformes, 1–2 mm. longae, late rotundatae vel oblongae et subtruncatae, apice minute denticulatae. *Involucra* 3–4 mm. longa, obconica, truncata, glabra, lutea, centrale masculum, lateralia bisexualia, glandulae transverse oblongae, integrae, 0·6 mm. longae, 1·5 mm. latae; lobi quadrati, fimbriato-dentati. *Ovarium* glabrum; stylus ad medium trifidus, ramis crassis linearibus apice emarginatis vel minute bifidis obtusis.—N. E. BROWN.

The plant from which the figure of *Euphorbia Ledienii* now given has been prepared is one that has been in cultivation in the succulent house at Kew since 1868, when it was presented by the late Admiral Sir A. Milne, along with various other South African succulent and bulbous plants received by him from Mr. Morrison. Another example of the species, now in the Kew collection, was acquired by purchase from Mr. A. Bennecke in 1893. The same species is said, however, to have been in the collection of Mr. W. W. Saunders at Reigate in 1866, and according to Mr. Berger, who first vindicated its right to specific rank in 1907, *E. Ledienii* is not uncommon in Continental gardens. Its nearest ally, among the species at present in cultivation, appears to be *E. coerulescens*, Haw., from which, as Mr. Brown points out, it differs by its more numerous and less

sinuous angles, its more distant and less marked constrictions, and its shorter spines. Like the other species of *Euphorbia* which share its habit, it grows very slowly, but it flowers freely every year in late autumn under ordinary tropical conditions.

Description.—*Shrub*, succulent, branching, soon leafless, 3 ft. or more high, quite glabrous. *Branches* sharply 5–7-angled, 1½–3 in. thick, slightly narrowed at intervals of from 3–8 in.; angles not or only slightly and at intervals hardened along the edge; grooves between the angles rounded concave. *Leaves* minute and scale-like, ½ lin. long, 1 lin. wide, wide rounded, soon disappearing. *Spines* in pairs, divergent, 2–4 lin. long, brown at first but becoming ash-grey, the pairs ⅓–¾ in. apart. *Cymes* bearing each three involucres, usually several in each axil, clustered, their stalks about 1 lin. long; bracts scale-like, ½–1 lin. long, wide rounded or oblong and slightly truncate, minutely denticulate at the tip. *Involucres* 1½–2 lin. long, obconic, truncate, glabrous, yellow; central male; lateral bisexual; glands transversely oblong, entire, about ¼ lin. long, ¾ lin. wide; lobes quadrate, fimbriately toothed *Ovary* glabrous; style trifid to the middle, its arms thick, linear, obtuse and emarginate or shortly bifid at the tip.

Fig. 1, a cyme; 2, longitudinal section of an involucre; 3, lobe of involucre; 4, male flower, with bracteoles; 5, entire plant, showing habit:—1–4 *enlarged*, 5 *much reduced*.

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TAB. 8276.

PELIOSANTHES VIOLACEA, var. CLARKEI.

South-eastern Asia.

HAEMODORACEAE. Tribe **OPHIOPOGONEAE.**

PELIOSANTHES, *Andr.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p 678

Peliosanthes violacea, var. Clarkei, *Baker in Journ. Linn. Soc.* vol. xvii. p. 504; *Hook. f. Flor. Brit. Ind.* vol. vi. p. 266; a typo floribus atropurpureis differt.

Herba, rhizoma breve. *Folia* oblongo-lanceolata, acuminata, ad 30 cm. longa, 6 cm. lata, glaberrima, marginibus corneis leviter crenulatis; nervi primarii circa 20; nervi transversi numerosi, conspicui; petiolus 12-30 cm. longus; vaginae basilares membranaceae, brunneae. *Racemi* circa 15 cm. longi; flores solitares, atropurpurei; bracteae oblongae, acuminatae, quam pedicelli longiores. *Perianthium* aperte campanulatum, 1 cm. diametro; tubus 6-sulcatus; lobi oblongi, apice rotundati. *Antherae* ovatae, basi bilobae. *Ovarium* conicum; stylus columnaris, trisulcatus.—*P. violacea*, Ridl. Journ. Str. Br. Roy. As. Soc. vol. xxxi. p. 96.—C. H. WRIGHT.

The genus *Peliosanthes* includes about a dozen species, all of which are natives of South-eastern Asia. Three of these have already been figured in this work; *P. Teta*, Andr., at t. 1302, *P. humilis*, Andr., at t. 1532, and *P. albida*, Baker, at t. 7110. The first of these, which has its flowers fascicled in the axils of the bracts, has an unusually wide range; it extends from the Eastern Himalaya throughout Western Indo-China to the Malayan Peninsula; throughout this area it is subject to remarkably little variation. Among those species in which the flowers are solitary in the axils of the bracts, that compose the bulk of the genus, the only one which is credited with an equally wide range is *P. violacea*, Wall. In the case of this species, however, Mr. Baker recognises, in addition to the typical form, which has a deep violet perianth and is found in the Eastern Himalaya and in the mountains of Assam to the east of the Brahmaputra river, also extending to Lower Burma, three distinct varieties. Two of these, var. *minor*, with small green flowers and leaves that are only 5–7-nerved, and var.

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princeps, a more robust plant than typical *P. violacea*, also with greenish flowers, are suspected by Mr. Ridley to be distinct from *P. violacea*. The third variety, recognised by Mr. Baker as var. *Clarkei*, which extends from the Khasia Hills in Assam southwards to the Malay Peninsula, and which is here figured, is believed by Mr. Ridley (Materials for a Flora of the Malayan Peninsula, pars ii. p. 89) to be the plant intended by Mr. Baker as *P. violacea* proper. This is not, however, the case, for while it is possible that Dr. Wallich did not consider these two forms, which hardly differ in morphological characters, to be distinct, the name *P. violacea* is restricted by Mr. Baker to the form with deep violet perianth; the form with dark-purple perianth here figured is kept apart by Mr. Baker as var. *Clarkei*. The plant now depicted was presented to Kew by Mr. Ridley in 1904; it had been obtained by him in Perak. It flowers annually in a tropical house, usually in April, and is one of the most attractive of the species of *Peliosanthes* cultivated at Kew.

DESCRIPTION.—*Herb*, rootstock short. *Leaves* oblong-lanceolate, acuminate, reaching 1 ft. in length, $2\frac{1}{2}$ in. wide, quite glabrous, margins cartilaginous, slightly crenulate; main nerves about 20; transverse veins numerous, conspicuous; petiole 5–12 in. long; basilar-sheaths membranous, brown. *Racemes* about 6 in. long; flowers solitary, dark purple; bracts oblong, acuminate, longer than the pedicels. *Perianth* rather wide campanulate, 5 lin. across; tube 6-channelled; lobes oblong, rounded at the tips. *Anthers* ovate, their bases 2-lobed. *Ovary* conoid; style columnar, 3-sulcate.

Fig. 1, a flower, three of the perianth-segments removed; 2, three of the stamens, and pistil; 3, anther; 4, section of ovary:—*all enlarged.*

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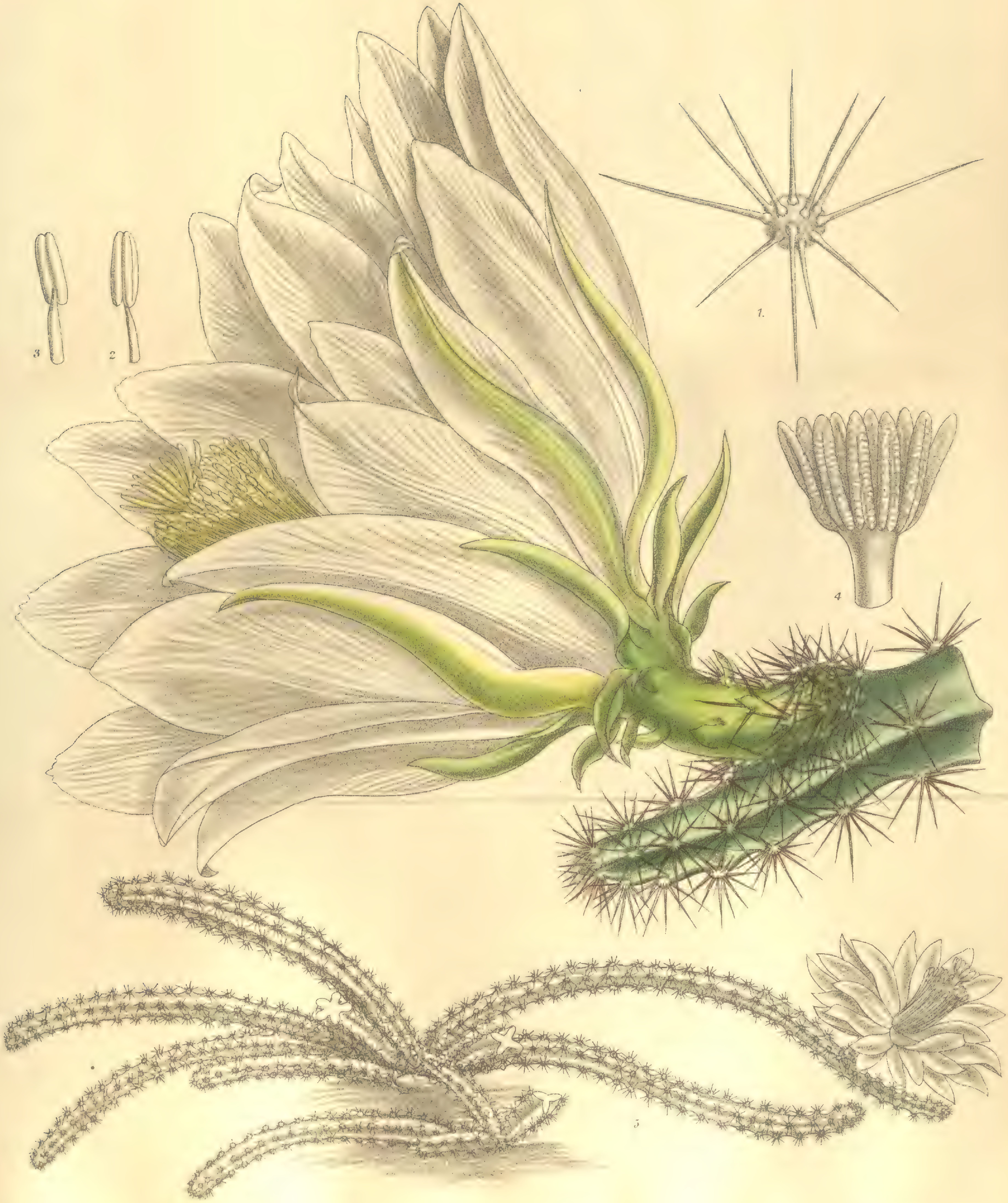

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TAB. 8277.

CEREUS AMECAMENSIS.

Mexico.

CACTACEAE.

CEREUS, *Haw.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 849.

Cereus amecamensis, *Heese ex Rother in Praktischer Ratgeb.* vol. xi. p. 442, cum ic.; species *C. speciosissimo*, DC. valde affinis, sed caulibus apice pallide viridibus et floribus albis differt.

Planta succulenta, basi ramosa. *Rami* elongati, erecti, procumbentes vel penduli, acute 3-5-angulati, 1·5-3 cm. crassi, pallide virides, angulis leviter dentato-sinuatis et pulvinis albo- vel griseo-tomentosis. *Spinae* 11-15, tenues, aciculares, 7-14 mm. longae, primum albae, demum brunneae. *Flores* magni, 15-17 cm. diam., albi, late infundibuliformi-campanulati, tubo supra ovarium perbreve. *Sepala* anguste lanceolata, acuta, interiora 7-8 cm. longa, exteriora multo minora, pallide viridia. *Petala* 2-3-seriata, 9-10 cm. longa, 2·5 cm. lata, lanceolata vel anguste oblongo-lanceolata, obtusa vel subacuta, alba. *Stamina* numerosa, filamentis albis, antheris pallide luteo-albis. *Ovarium* 4 cm. longum, spinosum et squamosum. *Stigmata* 6-10, pallide luteo-alba.—*Cereus amecamensis*, Heese in Hesdorf. Monatsheft. Blum.-Gartenfr. vol. i. p. 317; K. Schum. Monogr. Cact. p. 154.—N. E. BROWN.

The fine species here figured in general character resembles the well-known and brilliantly coloured *Cereus speciosissimus*, to which our plant is indeed very closely allied. The stems of the two are similar in appearance, though those of *C. speciosissimus* are mostly 3–4-angled, whereas in our plant, while the more erect stems are 3–4-angled, those that grow more or less horizontally are often, at least in part, 5-angled, and the growing shoots do not show the dull purplish tinge at the tips which characterise those of *C. speciosissimus.* In our plant, moreover, the flowers are pure white. *C. amecamensis* is a native of Mexico, where it was discovered by Mr. E. Heese on Iztaccihuatl Mountain, near Amecameca, growing as an epiphyte in the upper Fir-tree region, at about 7,800 ft. above the level of the sea. For its cultivation *C. amecamensis* requires the treatment suitable for *Phyllocacti*; an abundance of heat and moisture with ample sunshine in summer, and dryness near the root in winter. The large

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white flowers are produced in May or June. For the plant from which our figure has been made, Kew is indebted to the generosity of Mr. H. J. Elwes, of Colesborne, who presented it to the establishment in 1900 as an unnamed Cactus from Mexico.

DESCRIPTION.—*Herb,* with succulent stems, branching from the base; branches elongate, erect procumbent or pendulous, sharply 3–5-angled, $\frac{3}{4}$–1$\frac{1}{4}$ in. thick, pale green, the angles slightly sinuately toothed and with white- or grey-tomentose swellings. *Spines* in clusters of 11–15, slender, needle-like, 4–7 lin. long, at first white, at length brownish. *Flowers* large, white, 6–7 in. across, widely campanulately funnel-shaped, the tube above the ovary very short. *Sepals* narrow lanceolate, acute, the inner about 3 in. long, the outer much shorter, pale green. *Petals* 2–3-seriate, about 4 in. long, 1 in. wide, lanceolate or narrowly oblong-lanceolate, obtuse or subacute, pure white. *Stamens* numerous; filaments white, anthers pale yellowish white. *Ovary* 1$\frac{1}{2}$ in. long, beset with spines and scales; stigmas 6–10, pale yellowish white.

Fig. 1, a group of spines; 2 and 3, anthers from in front and from behind; 4, stigmas; 5, sketch of entire plant, showing habit:—1–4 *enlarged,* 5 *much reduced.*

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Tab. 8278.

CISSUS ADENOPODUS.

Uganda.

Ampelidaceae.

Cissus, *Linn.*; *Planch. in DC. Monogr. Phanerog.* vol. v. p. 470.—Vitis, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 387, *partim.*

Cissus (Cyphostemma) adenopodus, *Sprague in Kew Bull.* 1906, p. 247; species insignis foliis praesertim junioribus subtus rubris, paniculis planis ambitu triangularibus, pedicellis conspicue glanduloso-pilosis.

Herba, ope cirrhorum scandens. *Radix* tuberosa. *Caulis* teres, ut petioli petioluli cirrhique pilis numerosis multiseptatis et aliis glanduloso-capitatis paucioribus induta. *Folia* trifoliata; petioli subteretes, 3–6 cm. longi; petioluli 4–15 mm. longi, medius quam laterales longior; foliola ovata, acute acuminata, grosse serrata, lateralia basi inequaliter rotundata, terminale basi obtusum, 5–10 cm. longa, 3–5·5 cm. lata, utrinque setulosa, supra viridia venis depressis, subtus rubra venis prominentibus; stipulae falcato-lanceolatae, acutae, usque ad 1 cm. longae. *Paniculae* oppositifoliae, planae, ambitu triangulares, circiter 10 cm. longae pedunculo 3·5 cm. longo excluso, patule pilosae, rhachi rubra vel viridula, ramis alternantibus; bracteae inconspicuae; pedicelli circiter 4 mm. longi, pilis glanduloso-capitatis conspicuis et aliis eglandulosis brevibus inconspicuis induti, post anthesin recurvi. *Alabastra* circiter 3 mm. longa, apice pilosa. *Calyx* cupularis, usque ad 1 mm. altus, basi puberulus. *Petala* oblonga, 4 mm. longa, apice cucullata, cucullo piloso ceterum glabra, anthesi valde deflexa. *Stamina* prima anthesi ad stylum appressa; filamenta circiter 3 mm. longa; antherae late ellipticae, 0·7 mm. longae. *Ovarii* lobi 0·7 mm. longi; stylus 2·5 mm. longus. *Bacca* globosa, usque ad 1·5 cm. diametro.—T. A. Sprague.

Cissus adenopodus is a species that does not appear to be nearly related to any form hitherto described. It might perhaps be placed beside *C. Buchanani*, Planch. (Monogr. p. 601) which differs in having 5 leaflets and a very glandular inflorescence. For the introduction of this plant Kew is indebted to Mr. M. T. Dawe, who sent it in 1905 from the Mufukamata Forest, Uganda, as a "species of *Vitis* with red decorative foliage." It has grown very vigorously in a tropical house, where its long trailing stems, clothed with red leaves, are very attractive in summer. The leaves, as in the other species of the section to which it belongs, are deciduous; the measurements given in the text are average ones, the largest adult leaves met with reach a

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length of 8 to 9 in., including the petiole, and are about 7 in. broad. At Kew the plant flowers in autumn, while the fruits ripen in the following spring. The absence of gland-tipped hairs from the inflorescence, apart from those on the pedicels, is peculiar. Three kinds of hairs are found on *C. adenopodus*; subulate, acute, multiseptate hairs filled with red cell-sap; linear, gland-tipped hairs; and bodies which Mr. Sprague terms "pearl-glands." These last are met with on the inflorescence, usually near the base of the pedicels, on the under surface of young leaves, and on the outside of the stipules, near the base. These have been observed in numerous species of Ampelidaceae, and they seem, at least in certain cases, to serve as "food-bodies" for ants.

DESCRIPTION.—*Herb*, climbing by means of tendrils. *Root* tuberous. *Stem* terete, hirsute like the petioles, petiolules and tendrils with numerous many-septate, mixed with rather fewer gland-tipped hairs. *Leaves* 3-foliolate, petioles almost cylindric, 1¼–2½ in. long; petiolules 2–7 lin. long, the median the longest; leaflets ovate, abruptly acuminate, coarsely serrate, the lateral obliquely rounded, the central obtuse at the base, 2–4 in. long, 1¼–2¾ in. wide, setulose on both surfaces, green with sunken nerves above, red with prominent nerves beneath; stipules falcate-lanceolate, acute, reaching 5 lin. in length. *Panicles* leaf-opposed, flattened, triangular in outline, about 4 in. long, pedunculate, the peduncles 1½ in. long, hirsute with spreading hairs, the rachis red or greenish, the branchlets alternate; bracts inconspicuous; pedicels recurved after flowering, about 2 lin. long, clothed with conspicuous gland-tipped hairs mixed with short inconspicuous non-glandular ones; buds about 1½ lin. long, with pilose tips. *Calyx* cup-shaped, only ½ lin. long, puberulous below. *Petals* oblong, much deflexed, 2 lin. long, the tips hooded and pilose, elsewhere glabrous. *Stamens* at first adpressed to the style; filaments about 1½ lin. long, anthers wide-elliptic. *Ovary* distinctly lobed; style about 1 lin. long. *Berry* globose, about ⅔ in. across.

Fig. 1, bud; 2, a petal; 3, stamens and pistil; 4, pistil; 5, fruit; 6, seed:—*all enlarged.*

8279

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M.S. del. J.N.Fitch lith.

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Tab. 8279.

LAURELIA SERRATA.

Chile.

MONIMIACEAE. Tribe LAURELIEAE.

LAURELIA, *Juss.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 145; *Perkins & Gilg, Monimiaceae in Engl. Pflanzenr.* vol. iv. n. 101, p. 76.

Laurelia serrata, *Bertero in Mercur. Chil.* 1829, manip. 15, p. 685 *et transl. in Am. Journ. Sc.* 1833, vol. xxiii. p. 89 [nomen]; *Castillo & Dey, Geogr. Veg. Rio Valdivia*, p. 52; a *L. sempervirente* inflorescentiis abbreviatis, perianthii segmentis aequalibus, staminibus fertilibus 4 glabris, staminodiis, receptaculo fructigero subgloboso perianthii segmentis persistentibus coronato differt.

Arbor polygamo-monoica vel forsan dioica, 20 m. vel ultra alta, ligno foetido, ramis junioribus quadrangularibus, novellis fulvo-hirtis mox glabrescentibus nisi pilis in lateribus commissuralibus diutius persistentibus, vetustis cortice cinerascente tectis. *Folia* opposita, late oblongo-lanceolata vel lanceolata, obtusa vel subobtusa, praeter basin cuneatam serrata dentibus apice glanduloso-incrassatis, 5–12 cm. longa, 2–4·5 cm. lata, crasse coriacea, pellucide glandulosa, aromatica, costa supra prominula, nervis lateralibus obliquis utrinque circiter 9 tenuibus interdum obscuris; petiolus 5–7 mm. longus, supra dense hirtulus et nigricans. *Inflorescentiae* axillares, 1–1·5 cm. longae, cymosae vel cymoso-paniculatae, 3–9-florae, fulvo- vel cinereo-sericeae; bracteae caducissimae, inferiores ovatae ad 3 mm. longae; pedicelli 2–4 mm. longi; flores cymarum singularum nunc omnes masculi, nunc terminales tantum masculi caeteri hermaphroditi vel nonnulli rarius forsan omnes feminei. *Receptaculum* cupulare, nec tamen altum, extra sericeum. *Perianthii* segmenta 8, 2-seriata, aequalia, oblongo-elliptica, viridi-lutea, 2·5–3 mm. longa *Stamina* fertilia in floribus masculis hermaphroditisque 4, filamentis quam antheras brevioribus glabris basi utrinque glandula crassa oblonga munitis. *Staminodia* in floribus masculis 4 staminibus fertilibus minora ceterum praeter antheras redactas iis similia; in floribus hermaphroditis femineisque, quibus stamina fertilia desunt, staminodia 24–28 ab extra stamina gradatim redacta referentia, interiora plane squamiformia. *Ovaria* in floribus masculis 0, in floribus hermaphroditis femineisque pluria, pilosa, stylis ad medium pilosis. *Fructus* (receptaculum maturum) globosus, apice constrictus, demum irregulariter ruptus et stellatim apertus, cinereus, 7–8 mm. longus, perianthio emarcido coronatus; carpella singula ovoidea cum stylo persistente 10–12 mm. longa, pilis mollibus patulis inferioribus 5 mm. longis dense obsita.—*L. aromatica*, Gard. Chron. 1901, vol. xxxvi. p. 401, fig. 172; non Poir.—O. STAPF.

The tree here figured is a member of the small family Monimiaceae and belongs to a tribe for which the name Atherospermeae is sometimes used. The structure of the flowers and fruits in the genus *Laurelia* to which our plant

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belongs is, however, so similar to that met with in *Atherosperma*, Labill., that the late Mr. Baillon was led to think that the two are congeneric. The bracts met with at the base of the flowers in *Atherosperma*, which have been relied upon as affording a distinctive character, are also present in *Laurelia*, though there they are soon caducous and not, as in *Atherosperma*, persistent, so that the conclusion formed by Baillon is probably just.

The subject of our plate is a native of the southern parts of Chile, where it is known as the Huanhuan tree and is prized for its timber, though it is neither quite so common nor quite so valuable as another and better-known species of the same genus, *L. sempervirens*, Tul., the Chilian Laurel. The material from which our figure has been prepared was communicated to Kew by Mr. F. W. Moore of Glasnevin from a fine tree in the garden of the late Mr. Acton of Kilmacurragh, by whom it had been acquired from Messrs. Rollison of Tooting about 1868; an excellent figure of a fruiting specimen from the same tree was published in the Gardeners' Chronicle in December, 1904 (vol. xxxvi. p. 401, fig. 172) as *L. aromatica*, Poir. Bertero had, however, in 1829 pointed out that the species here dealt with is quite distinct from *L. aromatica*, and, although Bertero gave no technical description of the tree, Philippi subsequently distributed good specimens of the plant under the name *L. serrata*, Bertero. In spite of this, however, it became the practice to cite Bertero's name as a synonym of *L. sempervirens*, and this practice was persistently followed until in 1894 Castillo and Dey published rough figures of both species and drew attention to some of their salient differences. Since 1894 it has been generally recognised that there are really two Chilian species of *Laurelia*, but the rather inadequate character of the account supplied by Castillo and Dey has provided an excuse for an attempt to substitute the earlier name, *L. aromatica*, Poir., for that proposed by Bertero. As regards the name *L. aromatica*, it has, however, to be pointed out that Poiret applied it, in the first instance, to a specimen in the herbarium of Jussieu for which he provided a brief diagnosis which indicates that the leaves are quite entire. Tulasne, who saw the specimen belonging to Jussieu, has stated that it is in every respect identical with *L. sempervirens*. Moreover, the fuller description which follows the brief diagnosis given by Poiret appears to have been transcribed by that author from the original description of *Pavonia sempervirens* drawn up by Ruiz. With the object of preventing the recurrence of past misapprehensions, we have thought it desirable to provide here a somewhat full description of *L. serrata.*

In the garden at Kilmacurragh, Wicklow, the Huanhuan has attained, during its sojourn there of over forty years, a height of 33 ft., and has proved quite hardy; it is therefore likely to thrive in the milder parts of the British islands, and should prove an attractive addition to favourably situated outdoor collections, on account of its pleasing aspect and its aromatic properties. Mr. Moore informs us that the climate at Kilmacurragh is very moist and there are spring frosts, but as vegetation is late in starting, plants generally escape injury. The Huanhuan is of a somewhat stiff habit of growth and the leaves are thick and firm, so that shelter is an essential condition for its successful cultivation; the Kilmacurragh example has thriven admirably on a raised bank in good, stiff loam, well sheltered, but not overhung by trees and shrubs. It is very difficult to get cuttings of *L. serrata* to root, and the only available method of propagation is by layers.

DESCRIPTION.—*Tree,* polygamo-monoecious or perhaps sometimes dioecious, in the wild state reaching a height of 70 ft.; wood fœtid; branches at first 4-angled; young shoots tawny, hairy but soon becoming glabrous save for the somewhat persistent hairs along the lateral commissures; old bark ashy-grey. *Leaves* opposite, widely oblong-lanceolate or lanceolate, obtuse or nearly so, serrate except at the cuneate base, the teeth glandular thickened at the tips, 2–5 in. long, $\frac{3}{4}$–$1\frac{3}{4}$ in. wide, firmly leathery, dotted with pellucid glands and aromatic, lateral veins oblique, slender, sometimes hardly apparent, about 9 on each side, midrib rather conspicuous above; petiole 2–4 lin. long, rather densely hairy above and blackish. *Inflorescences* axillary, 5–8 lin. long, simply or paniculately cymose, 3–9-flowered, tawny or grey silky; bracts very caducous, the lower ovate nearly 2 lin. long; pedicels 1–2 lin. long; flowers sometimes all male, sometimes only the terminal male, the rest hermaphrodite or some of them female, perhaps at times all female. *Receptacle* shallowly cup-shaped, silky without. *Perianth* segments 8, 2-seriate, equal, oblong-elliptic, greenish-yellow, about 1½ lin. long. *Stamens* in male and hermaphrodite flowers 4 perfect, with filaments shorter than the anthers, each with a pair of thick oblong basal glands. *Staminodes* in male flowers 4, smaller than the perfect stamens, but otherwise like these save for the much reduced anthers; in hermaphrodite and in female flowers 24–28, the outer like reduced perfect stamens, but gradually more and more reduced so that those of the inmost series are scale-like. *Ovaries* not even represented by rudiments in male flowers; in hermaphrodite and female flowers several, hirsute, tipped by long styles hirsute in their lower half. *Fruit* (ripe receptacle) globose, constricted at the top, ultimately splitting irregularly and opening starwise, ash grey, 3–4 lin. long, crowned by the withered perianth; carpels ovoid, 5–6 lin. long, including the persistent style, densely hirsute with soft spreading hairs, the lowest of which are 2½ lin. long.

Fig. 1, part of a cyme, showing a terminal male and a lateral hermaphrodite flower with two detached bracts; 2, half of a male flower, laid open; 3, diagram of a hermaphrodite flower; 4, hairs from the inflorescence; 5, fertile stamen; 6, 7, 8 and 9, staminodes from a hermaphrodite flower; 10, carpels and part of the shallow receptacle; 11, section of a carpel; 12, fruits (ripe receptacles); 13, a single ripe carpel:—*all enlarged except* 12, *which is of natural size.*

M. S. del. J. N. Fitch, lith.

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TAB. 8280.

RHODODENDRON COOMBENSE.

China.

ERICACEAE. Tribe **RHODODENDREAE.**

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron coombense, *Hemsl.*; species nova ex affinitate *R. concinni*, Hemsl., a quo differt calycis lobis parvis haud ciliatis et stylo infra medium pilosulo.

Frutex nanus, dense ramosus, ramis floriferis graciliusculis lepidotis. *Folia* sparsa internodiis quam petiolis saepius paulo longioribus, persistentia, coriacea, oblongo-lanceolata, cum petiolo 3–4 mm. longo 3–4 cm. longa, apiculata, basi cuneata vel subrotundata, primum utrinque lepidota, supra demum glabrescentia, subtus densissime lepidota, inter lepides pallida, venis immersis inconspicuis. *Flores* 3–4 cm. diametro, 3–5 in ramulorum apicibus aggregati, pedicellis gracilibus 0·5–1 cm. longis dense lepidotis. *Calycis* lobis brevissimis rotundatis. *Corolla* late campanulata, pallide purpurea, lobis ovatis obtusis leviter recurvis. *Stamina* 10, alterna breviora, longiora corollam haud excedentia; filamenta filiformia, infra medium barbata. *Ovarium* 5-loculare, densissime lepidotum, stylo curvato stamina paulo excedente infra medium pilosulo.—W. B. HEMSLEY.

The group of Rhododendrons to which *R. concinnum*, Hemsl., and the form here figured belong, includes a considerable number of very closely allied plants, and Mr. Hemsley explains that in proposing a distinctive name for the subject of our plate he does so with the object of avoiding possible confusion rather than for the purpose of expressing a conviction that *R. coombense* deserves to rank as a species. Messrs. J. Veitch and Sons, who in 1907 communicated the flowering specimens of *R. coombense* here made use of, have raised a large number of forms from seed collected by Mr. E. H. Wilson in China. Most of these forms it has been possible to match with the herbarium specimens prepared by the same collector; there are, however, others of which Mr. Wilson, when gathering the seeds, could obtain no flowering specimens. A comprehensive study of the whole material thus acquired is necessary in order to lead to a better knowledge of the extent to which seminal variation occurs, and to some

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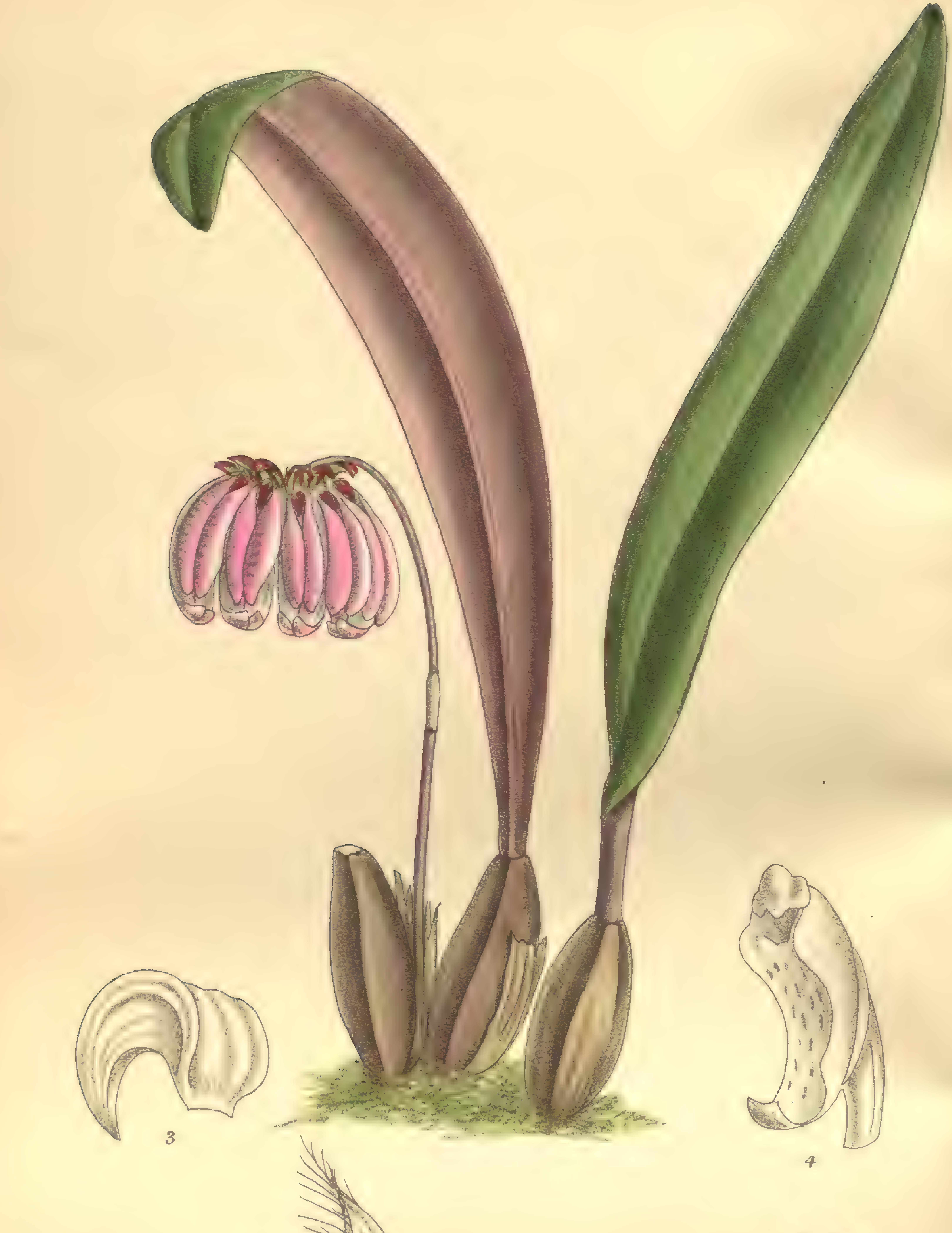
conclusion as to whether natural hybrids are present among these obviously nearly related forms. A living plant of the form now described, presented by Messrs. Veitch to the Kew Collection, flowered there during the spring of 1909.

DESCRIPTION.—*Shrub*, dwarf and densely branching, the flowering twigs rather slender, lepidote. *Leaves* sparsely set, their internodes usually rather longer than the petioles, persistent, coriaceous, oblong-lanceolate, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, apiculate, base cuneate or somewhat rounded, at first lepidote on both surfaces, ultimately glabrescent and very dark green above, beneath remaining persistently densely lepidote and pale green between the scales; nerves immersed and inconspicuous; petiole short, 2 lin. long or less. *Flowers* $1\frac{1}{4}$–$1\frac{1}{2}$ in. across, in trusses of 3–5 at the tips of the branchlets; pedicels slender, 3–5 lin. long, densely lepidote. *Calyx-lobes* very short, rounded. *Corolla* wide campanulate, pale purple; lobes ovate, obtuse, slightly recurved. *Stamens* 10, alternately shorter and longer, the longest not longer than the corolla; filaments filiform, bearded below the middle. *Ovary* 5-celled, very densely lepidote; style curved, rather larger than the stamens, slightly hairy below the middle.

Fig. 1, portion of upper surface of a young leaf; 2, portion of lower surface of leaf; 3, scales from the same; 4 and 5, bud-scales from the inflorescence; 6, calyx and pistil; 7 and 8, stamens:—*all enlarged*.



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TAB. 8281.

BULBOPHYLLUM CAMPANULATUM.

Sumatra.

ORCHIDACEAE. Tribe EPIDENDREAE.

BULBOPHYLLUM, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 501.

Bulbophyllum (Cirrhopetalum) **campanulatum,** *Rolfe in Kew Bull.* 1909, p. 62; a *B. aurato*, Reichb. f., sepalis lateralibus brevioribus connatisque et petalis haud falcato-aristatis differt.

Herba epiphytica. *Pseudobulbi* approximati, ovoideo-oblongi, obscure tetragoni, 2–2·5 cm. longi, monophylli. *Folia* oblonga, obtusa, coriacea, 8–9 cm. longa, circa 2 cm. lata, subtus purpurea. *Scapi* graciles, suberecti, circa 8 cm. longi, apice decurvi, circa 10-flori. *Flores* umbellati, radiati, recurvi, in inflorescentias subcampanulatas dispositi. *Bracteae* subulato-lanceolatae, recurvae, 4–5 mm. longae. *Pedicelli* 5 mm. longi. *Sepalum* posticum elliptico-ovatum, acuminatum, longe ciliatum, concavum, 6 mm. longum; sepala lateralia connata, decurva, limbus oblongus, subacutus, convexus, apice subrecurvus, 1·5 cm. longus, 8 mm. latus. *Petala* ovata, subacuta vel apiculata, ciliata, 4–5 mm. longa. *Labellum* recurvum, carnosum, oblongum, subacutum, 3–4 mm. longum. *Columna* lata, 3 mm. longa; stelidia obtusa vel truncata.—R. A. ROLFE.

The specific name proposed for the elegant little species here figured has reference, Mr. Rolfe explains, to the shape assumed by the inflorescence in consequence of the strong decurvature of the lateral sepals of the individual flowers. In referring this plant, and the whole of the section *Cirrhopetalum* to which it belongs, to the genus *Bulbophyllum*, Mr. Rolfe has adopted a comprehensive view that is admittedly unassailable on taxonomic grounds. At the same time, the recognition of the section *Cirrhopetalum* as a floristic group apart from *Bulbophyllum* is a measure that has, owing to the considerable number of the forms that may without dubiety be referred to one as apart from the other group, certain practical advantages that appeal to cultivators, and it will probably always be found convenient from the horticultural point of view to treat this plant as a *Cirrhopetalum*. The species is a native of Sumatra, from the eastern coast of which island it was first introduced to the Botanic Gardens at Brussels. From that institution the plant from which our plate has been prepared was communicated in 1908 to Kew, and came into flower there in October of that year. It thrives satisfactorily under the tropical conditions suited to other species of the genus from south-east Asia.

Description.—*Herb*, epiphytic; pseudobulbs rather close-set, ovoid-oblong, obscurely 4-angled, ¾–1 in. long, monophyllous. *Leaves* oblong, obtuse, leathery, 3–3½ in. long, about ¾ in. wide, purple beneath. *Scapes* slender, suberect with decurved apices, about 3 in. long and about 10-flowered. *Flowers* umbellate, their pedicels 2½ lin. long, radiating, recurved so as to form a somewhat campanulate inflorescence; bracts subulate-lanceolate, recurved, 2–2½ lin. long. *Sepals*, posterior elliptic-ovate, acuminate, long-ciliate, concave, 3 lin. long; lateral connate decurved, oblong, subacute, convex, with subrecurved tips, 8 lin. long, 4 lin. wide. *Petals* ovate, subacute or apiculate, ciliate, 2–2½ lin. long. *Lip* recurved, fleshy, oblong, subacute, 1½–2 lin. long. *Column* broad, 1½ lin. long; stelidia obtuse or truncate.

Fig. 1, flower; 2, column and lip; 3, lip; 4, column; 5, pollinia:—*all enlarged.*

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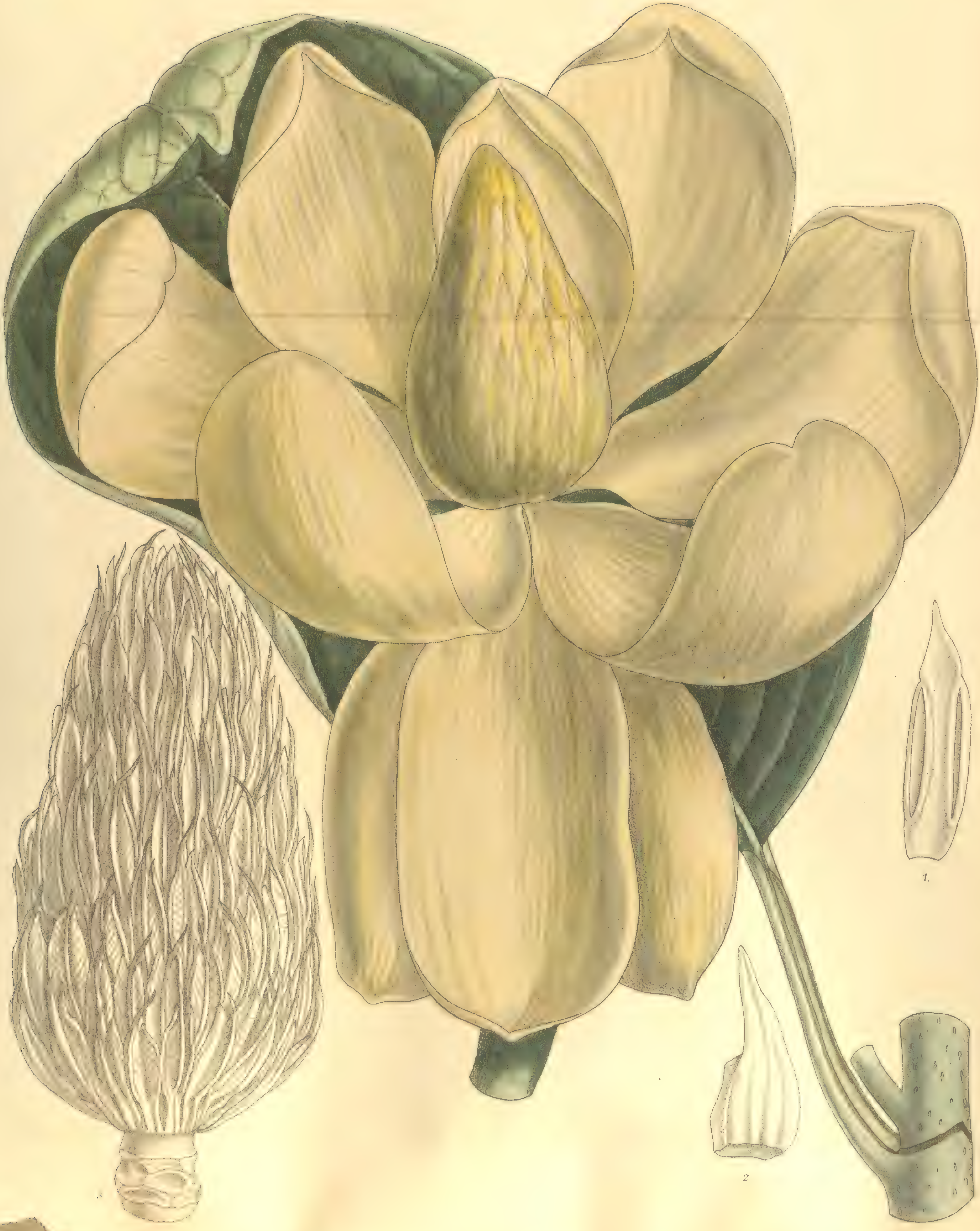

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Tab. 8282.

MAGNOLIA Delavayi.

China.

Magnoliaceae. Tribe Magnolieae.

Magnolia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 18.

Magnolia Delavayi, *Franch. Pl. Delavay.* p. 33, t. 9–10; *Finet et Gagnep. Contrib. Fl. As. Or.* fasc. ii. p. 36; species distincta, nulli arcte affinis, foliis iis *Talaumae ovatae,* St. Hil., simillimis.

Frutex, 2·5 m. altus, vel *arbor,* 4·5–9 m. alta, cortice lenticelloso. *Folia* ovata, ovato-oblonga vel elliptica, basi rotundata vel obtusa, apice obtusa vel rotundata (rarius retusa) plus minusve mucronulata, 18–32 cm. longa, 10–18 cm. lata, persistentia, coriacea, exsiccando creberrime conspicue reticulata, supra glabra nervo medio interdum puberulo, subtus puberula, pruinosa, nervo medio prominente pubescente; nervi secundarii utrinsecus 11–16; petioli 5–10·5 cm. longi, plano-convexi; stipulae circiter 7 cm. longae, extra pubescentes, caducae. *Flores* gilvi, suaveolentes. *Sepala* 3, oblonga, usque ad 9 cm. longa et 4 cm. lata, reflexa. *Petala* circiter 7, anguste obovata vel spathulato-obovata, inaequalia, 8·5–11 cm. longa, 3–5 cm. lata. *Stamina* 2–2·5 cm. longa; filamenta circiter 4 mm. longa; antherarum loculi sublineares, discreti, connectivo supra loculos in appendicem lanceolatam acutam producto. *Carpella* inferne tomentosa, superne sensim angustata, glabriuscula, extra sulcata. *Fructus* 11–14 cm. longi, ovoideo-oblongi; folliculae subrhomboideae, breviter cuspidatae. *Semina* (ex *Franchet*) obovata, lucida.—T. A. Sprague.

It is unfortunate that this fine Magnolia, which is a very distinct and striking species, is not quite hardy enough to thrive in the open air at Kew. Its large persistent leaves, which closely resemble those of *Talauma ovata,* St. Hil., and its noble, creamy white flowers would have made it an even more notable tree than *M. grandiflora,* Linn., the only other evergreen Magnolia at present available, a form of which is figured at t. 1952 of this work. Both at Kew and in the gardens of Messrs. Veitch at Coombe Wood *M. Delavayi* succeeds very well against a wall; even the late trying winter has not injured it at all. The species appears to be confined to Yunnan, where it occurs at altitudes between 5500 and 7000 ft. above sea-level. In rocky places it is a shrub about 8 ft. high, but in more favourable situations it grows into a tree 15–30 ft. in height. It ought to make a

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fine addition to the garden flora of the milder parts of the kingdom, such as Cornwall, South Wales, or wherever the large-leaved Rhododendrons thrive. The plant from which our figure was prepared flowered at Kew in July, 1908. It was presented by Messrs. Veitch in 1902, having been introduced by Mr. E. H. Wilson for that firm during his first journey in China. The Magnolias like a warm open soil that does not readily parch. A mixture of sandy peat with the ordinary soil is a help to them when newly planted out.

DESCRIPTION.—*Shrub*, 8 ft. high, or a small tree 15–30 ft. high; bark lenticelled. *Leaves* ovate, ovate-oblong or elliptic, somewhat mucronulate and obtuse or rounded, rarely retuse, at the tip, rounded or obtuse at the base, 7–13 in. long, 4–7 in. broad, persistent, coriaceous, when dry closely and conspicuously reticulated, glabrous above except at times along the midrib, puberulous beneath and pruinose, the midrib prominent and pubescent, lateral nerves 11–16 on each side; petiole 2–4½ in. long, plano-convex; stipules about 2½ in. long, pubescent outside, caducous. *Flowers* creamy white, odorous. *Sepals* 3, oblong, 3½ in. long, 1½ in. broad, reflexed. *Petals* about 7, narrow obovate or spathulate-obovate, unequal, 3¼–4¼ in. long, 1¼–2 in. broad. *Stamens* ¾–1 in. long; filaments about 2 lin. long; anther-cells sublinear, discrete, the connective extending beyond the cells as a lanceolate acute appendix. *Carpels* tomentose below, gradually narrowed upwards and there almost glabrous, sulcate on the outer side. *Fruit* 4¼–5½ in. long, ovoid-oblong; follicles somewhat rhomboid, shortly cuspidate. *Seeds*, according to Franchet, obovate, shining.

Fig. 1, anther; 2, carpel; 3, fruit:—1 *and* 2 *enlarged.*

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TAB. 8283.

PIERIS FORMOSA.

India and China.

ERICACEAE. Tribe ANDROMEDEAE.

PIERIS, *D. Don ; Benth. et Hook. f. Gen. Plant.* vol. ii. p. 588.

Pieris formosa, *D. Don in Edinb. N. Phil. Journ.* vol. xvii. 1834, p. 159; *DC. Prodr.* vol. vii. p. 599; *Clarke in Hook. f. Fl. Brit. Ind.* vol. iii. p. 461; *Gard. Chron.* 1881, vol. xv. p. 568, fig. 107; *Forbes et Hemsl. in Journ. Linn. Soc.* vol. xxvi. p. 16; a *P. japonica*, D. Don, statura robustiore, foliis lanceolatis oblongo-lanceolatis vel elliptico-oblongis majoribus, inflorescentia et floribus majoribus differt.

Frutex erectus, sempervirens, vel *arbor* 3·5–6 m. alta, ramis vetustis cortice laxo passim deglubente, ramulis glaberrimis. *Folia* apice ramulorum paulum conferta, lanceolata, oblongo-lanceolata vel elliptico-oblonga, 5–13 cm. longa, 1·5–4·7 cm. lata, acuminata, basi saepius subrotundata, crebre serrulata, coriacea, glaberrima, nitida; petioli 5–10 mm. longi ut folia juvenilia et gemmae saepe atro-rubri. *Flores* penduli in paniculis terminalibus erecto-patentibus vel interdum paulum pendulis ad 15 cm. longis latisque dispositi; rhachis glaberrima vel minute puberula, ramulis numerosis paulum confertis fere glabris; bractae lanceolatae, pedicellis saepe leviter breviores, mox deciduae; pedicelli circiter 5 mm. longi, crassi, prope medium bracteolis duabus parvis instructi. *Calycis* lobi alabastro valvati, coriacei, ovato-lanceolati vel ovati, 3–4 mm. longi, subacuti, minute puberuli vel glaberrimi. *Corolla* urceolaris, alba vel interdum pallide rosea, 7–8 mm. longa, brevissime obtuseque 5-lobata. *Stamina* 10, inclusa; filamenta parce pilosa, basi dilatata; antherae dorso retrorse biaristatae. *Ovarium* depresso-globosum, circiter 2 mm. diametro, 5-loculare, loculis pluri-ovulatis; stylus corolla leviter brevior. *Fructus* globosus vel ovoideo-globosus, 4–6 mm. diametro. *Semina* subtriquetro-fusiformia, 2–3 mm. longa, testa laxa.—*Andromeda formosa*, Wall. Cat. n. 761, et in As. Res. vol. xiii. p. 395; D. Don, Prodr. Fl. Nep. p. 149; Wight, Ic. t. 1200; Lemaire in Ill. Hort. vol. v. t. 162 *Comarostaphylis? formosa*, Lemaire l.c. sub t. 162. *Gaultheria* sp., Griff. Itin. Not. p. 125, n. 430, et Ic. Pl. As. t. 517.—S. A. SKAN.

The introduction into European gardens of this handsome *Pieris* appears to have taken place upwards of half a century ago, for Lemaire, writing in 1858 about what is almost certainly the same species, states that it had been in cultivation for some years, though its precise history was unknown to him. Doubt has to be expressed as to whether the plant described and figured by him in the Illustration Horticole cited above is the same as that originally named

Andromeda formosa by Wallich, for Wallich's plant has several ovules in each cell of the ovary, whereas the plant of the Illustration Horticole according to the description and the figure has only one ovule in each cell. Apart from this there is no reason to question the identity of the two. In the Genera Plantarum *Pieris formosa* is placed in the section Portuna, which is characterised as follows:—Sepals valvate in bud, coriaceous; seeds almost all pendulous, sometimes winged; leaves coriaceous, serrate; racemes simple, axillary, or paniculate at the ends of the branches; bracts and bracteoles caducous. The same section includes *P. japonica*, D. Don, and *P. floribunda*, Benth. et Hook. f. (Andromeda floribunda, *Pursh*), both of which are much smaller in stature, with smaller leaves and inflorescences.

P. formosa is a native of the Eastern Himalaya, from Nepal to Bhotan, at elevations of from 6000 to 10,000 ft., of the Ghombunda Hills in Assam, and of Manipur. It has also been recorded from Yunnan in South-west China, and specimens of apparently the same species have been collected in Hupeh, Central China, by Henry. At Kew this shrub appears to be capable of withstanding all but the severest frosts. An old plant was cut to the ground in February, 1895, but afterwards sprang up again, and survived the winter of 1908–9 without injury. At the same time it certainly prefers warmer conditions, especially in spring, and is seen at its best as it grows in gardens in the south-western parts of England; at Pentillie Castle, for example, there is a specimen 20 ft. high and 30 ft. through. The plant from which the figure now given has been prepared was raised from seed sent from the Royal Botanic Garden, Calcutta, in 1902; this plant, although only about 4 ft. high, flowered profusely in May, 1908. Like most of its allies, *P. formosa* prefers a peaty soil, but will, nevertheless, thrive excellently in a warm, open loam, free from calcareous matter, in a position where it is not liable to suffer from dryness at the root. Seeds afford the best means of increase.

DESCRIPTION.—*Shrub* or small *tree*, reaching 20 ft. in height, old branches with somewhat peeling bark, twigs glabrous. *Leaves* somewhat clustered at the ends of the twigs, lanceolate, oblong-lanceolate or elliptic-oblong, 2–5 in. long, ½–1¾ in. broad, acuminate, base often rather rounded, finely serrulate, coriaceous, quite glabrous, shining; petiole 3–5 lin. long, usually dark red, as are the young leaves and the buds. *Flowers* pendulous in terminal spreading or drooping panicles 6 in long and broad; rachis glabrous or finely puberulous, flowering twigs almost glabrous; bracts lanceolate, often somewhat shorter than the pedicels, soon deciduous; pedicels about 2½ lin. long, with a pair of small bracteoles near the middle. *Calyx-lobes* valvate in bud, coriaceous, ovate-lanceolate or ovate, 1½–2 lin. long, subacute, finely puberulous or glabrous. *Corolla* urceolate, white or tinged with rose, 3½–4 lin. long, shortly and bluntly 5-lobed. *Stamens* 10, included; filaments sparingly hairy, dilated at the base; anthers retrorsely 2-spurred on the back. *Ovary* depressed globose, about 1 lin. across, 5-celled, each cell with several ovules; style rather shorter than corolla. *Fruit* globose or ovoid-globose, 2–3 lin. in diameter. *Seeds* fusiform, faintly 3-quetrous, 1–1½ lin. long; testa lax.

Fig. 1, flower; 2, section of calyx, showing pistil; 3 and 4, anthers; 5 and 6, fruit:—*all except 5 enlarged.*

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TAB. 8284.

COTONEASTER MOUPINENSIS, forma FLORIBUNDA.

Western China.

ROSACEAE. Tribe POMEAE.

COTONEASTER, *Medik.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 627.

Cotoneaster moupinensis, *Franch. in Arch. Nouv. Mus. Hist. Nat. Par.* sér. 3, vol. viii. p. 224; speciei ex affinitate *C. acuminatae*, Lindl., sed foliis bullatis, floribus paucioribus brevissime fasciculatis stylisque 2–3 recedentis **forma floribunda,** a forma typica non nisi corymbis plurifloris sejungenda.

Frutex ramis junioribus adpresse hirsuto-pubescentibus deinde glabrescentibus, cortice castaneo fuscove tectis. *Folia* ovato- vel oblongo-elliptica, basi obtusa vel rotundata, apice acuta vel acutissime subacuminata, 5–8 cm. longa, 2·5–4 cm. lata, supra saturate viridia, pilis longis tenuissimis adpressis sparse conspersa mox calvescentia, subtus tenuiter ochraceo- vel griseo-villosula, nervis lateralibus obliquis utrinque 6–8 supra impressis infra prominentibus, parenchymate bullato; petiolus brevis, 2 mm. longus, hirtus. *Inflorescentiae* corymbosae ramulos foliatos 2–4 cm. (rarius ultra) longos terminantes, 20–30-florae, interdum pluriflorae, 3–6 cm. latae, pilis adpressis cinereo-hirtae; pedicelli brevissimi vel sub anthesi ad 3 mm. longi. *Receptaculum* sub anthesi turbinato-hemisphaericum, laxe pilosum vel superne glabratum, 3–4 mm. diametro. *Calycis* dentes triangulares, acuti, dense albo-ciliati, breves. *Petala* rotundato-ovata, in dorso rubescentia, 3·5 mm. longa, sub anthesi erecta. *Stamina* circiter 20. *Styli* 5; carpella in vertice pilosula. *Fructus* rubri, turbinato-globosi vel globosi, 8–10 mm. longi.—*C. bullata*, Bois in Vilmor. Frutic. Cat. prim. c. icon. p. 119; **Schneid. Laubholzk. vol. i. p. 747.—O. STAPF.**

The Cotoneasters as a rule succeed particularly well at Kew, and the species which forms the subject of our plate is no exception to this rule. It has very little beauty of flower, for only one or two flowers are open at the same time on individual corymbs, and the petals of these fall almost immediately. It is nevertheless an attractive garden shrub by reason of its large bullate leaves and its abundant crop of brilliant red berries. In September, when these berries are ripe and cover the upperside of its long arching shoots, there are few hardy shrubs that are more ornamental.

C. moupinensis is a native of Western China, and was originally discovered near Moupine by the Abbé David in 1870. It was found again in 1897 near Tachienlu, not far

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from Moupine, by a correspondent of Mr. M. L. de Vilmorin, and was once more met with at a later date in the same neighbourhood by Mr. E. H. Wilson. The seeds, numbered 2123, received by Mr. de Vilmorin, yielded a number of plants on which Mr. Bois has based the account of his *C. bullata*; a specimen taken from one of these plants was communicated to the herbarium at Kew in 1902 by Mr. de Vilmorin, who in 1905 presented to the Kew collection a living example, now a vigorous bush 6 ft. high, from which has been taken the material on which t. 8284 and the description by Dr. Stapf have been based. With this material the specimen (sem. 2123) communicated in 1902 exactly agrees. But that specimen and the specimens taken from the plant now figured also agree with the specimen on which the late Mr. Franchet based his original account of *C. moupinensis*, for an opportunity of examining which we are indebted to the courtesy of Mr. Lecomte, except for the fact that the number of flowers and fruits in each corymb is much greater in Mr. de Vilmorin's plant than in that gathered by the Abbé David. But the suite of specimens collected near Tachienlu, within a very limited area, by Mr. Wilson prove that this character is quite unstable, and Dr. Stapf is therefore led to conclude that *C. bullata*, Bois, is only a form, not sufficiently distinct to be considered a variety, of *C. moupinensis*, Franch. There is in the Kew collection a specimen presented by Mr. de Vilmorin as *C. moupinensis*, which agrees exactly with the Abbé David's plant, but Dr. Stapf points out that the figure of *C. bullata* given in Mr. de Vilmorin's "Fruticetum" seems to be referable to the type rather than to the *floribunda* form here depicted. It has, however, to be remarked that both Bois and Schneider lay stress on the shape of the calyx-lobes which they describe and figure as rounded in *C. bullata*, instead of triangular as in typical *C. moupinensis*. But an examination of Mr. de Vilmorin's specimens, both the dried and the living, of the form on which *C. bullata* was founded shows that they are just as triangular as in the type of Franchet's species. The indumentum of the receptacle varies from "uniformly slightly villous" to "slightly villous below, nearly glabrous above." The abundant crop of seeds affords a ready means of increase of this plant, and it can also be propagated by layers.

DESCRIPTION.—*Shrub*, twigs adpressed hirsute at length becoming glabrous, bark chestnut-brown or tawny. *Leaves* ovate- to oblong-elliptic, base obtuse or rounded, apex acute or sharply subacuminate, 2–3 in. long, 1–1$\frac{3}{4}$ in. broad, dark green and sparingly adpressed hirsute but soon becoming glabrous above, beneath thinly yellowish or grey hirsute, lateral nerves oblique, 6–8 on each side, sunk above, prominent beneath, bullate between the nerves; petiole short, about 1 lin. long, hairy. *Corymbs* 20–30- (occasionally more-) flowered, 1$\frac{1}{4}$–2$\frac{1}{2}$ in. across, greyish hirsute with adpressed hairs, at the tips of leafy twigs $\frac{3}{4}$–1$\frac{3}{4}$ in. long, rarely longer; pedicels short, reaching 1$\frac{1}{2}$ lin. in length. *Receptacle* in flower turbinately hemispheric, laxly pilose throughout or almost glabrous above, 1$\frac{1}{2}$–2 lin. wide. *Calyx* teeth triangular, acute, densely white-ciliate, short. *Petals* rounded ovate, reddish on the back, under 2 lin. long, erect in flower. *Stamens* about 20. *Styles* 5; carpels with somewhat hairy tips. *Fruit* red, turbinately or quite globose, 4–5 lin. long.

Fig. 1, a flower bud; 2, flower, perianth partly removed, showing staminal insertion and styles; 3 and 4, stamens:—*all enlarged.*

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TAB. 8285.

CEPHALOTAXUS DRUPACEA.

China and Japan.

CONIFERAE. Tribe TAXEAE.

CEPHALOTAXUS, *Sieb. et Zucc.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 430; *Pilger in Engl. Pflanzenr. Taxaceae,* p. 100, fig. 19.

Cephalotaxus drupacea, *Sieb. et Zucc. Fl. Jap. Fam. Nat.* vol. ii. p. 108, et *Fl. Jap.* vol. ii. p. 66, tt. 130, 131; *Mast. in Journ. Linn. Soc. Bot.* vol. xxvi. p. 544; species inter affines foliis brevioribus breviter aculeato-acutis distinguenda.

Arbor dioica, omnino glabra, in locis subtropicis usque ad 10-metralis, in regionibus temperatis ut in horto Kewensi *frutex* ramosus paucimetralis tantum. *Folia* persistentia, alterna, spiraliter disposita sed in una planitie expansa, lineari-subulata, iis *Taxi* similia, crassiuscula, 1·5–3 cm. longa, 2–3 mm. lata, abrupte aculeato-acuta, basi constricta, breviter petiolata petiolo semitorto, costa supra elevata, margine obtusa. *Flores masculi* circiter 10 in inflorescentiam breviter pedunculatam axillarem solitariam globosam 3–4 mm. diametro aggregati, basi 1-bracteati, pedunculo squamis imbricatis dense obtecto; antherae in quoque flore 5–8, saepius triloculares loculis rima longitudinale dehiscentibus. *Flores feminei* solitarii, ovati, circiter 5 mm. diametro, distincte pedicellati; carpidia carnosa, 2-ovulata. *Semen* saepissime in quoque flore singulum tantum evolutum, nudum, ovoideum, circiter 3 cm. longum; testa exterior crassa, carnosa, interior dura, cornea. *Embryo* parvus, cylindricus, axilis, in parte superiore albuminis situs; cotyledones 2, breves.—*Taxus baccata*, Thunb. Fl. Jap. p. 275, non Linn.; fide Pilger.—W. BOTTING HEMSLEY.

The genus *Cephalotaxus*, as limited by Dr. Pilger in 1903 in the Pflanzenreich, includes six recent species inhabiting Eastern India, Burma, China and Japan. The form distinguished by Siebold and Zuccarini as *C. pedunculata* is considered by Pilger to be only a variety of *C. drupacea*, and wild specimens in the herbarium at Kew, which are intermediate in character between the two, appear to justify this conclusion. *Cephalotaxus* differs from the more nearly allied genera in having a pair of ovules on each scale, and *Torreya nucifera*, Sieb. and Zucc., the herbarium specimens of which are extremely like those of *C. drupacea*, may be most easily distinguished by its narrowly lanceolate leaves tapering more gradually

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towards the tip. The plant from which the figure now given has been prepared has long been in the collection at Kew. It is a spreading bush, now 10 ft. high and 15 ft. through, furnished to the ground with luxuriant dark green foliage. In its bolder leaves and larger fruits it provides an agreeable contrast with the common Yew, and is very well adapted for semi-shaded places in the garden or as part of the undergrowth in thin woodland. The fruits are not produced plentifully every year, but they usually occur in sufficient quantity to afford an adequate and convenient means of increase. Any good soil suits the species; the chief point to be kept in mind in its cultivation is that it loves abundant moisture.

DESCRIPTION.—*Tree*, dioecious and glabrous throughout, in the warmer parts of its area reaching a height of 35 ft., in cooler tracts, as in the Kew collection, rather a branching *shrub* about 10 ft. high. *Leaves* persisting, alternate and spirally attached, but assuming a position bringing them into one plane, linear-subulate and Yew-like, rather thick, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, 1–$1\frac{1}{2}$ lin. broad, suddenly sharp-pointed, narrowed at the base and shortly petioled, the petioles mostly partially twisted, midrib prominent above, margins obtuse. *Male flowers* in short peduncled solitary globose axillary inflorescences usually about 10-flowered, $1\frac{1}{2}$–2 lin. wide, bracts 1-flowered, peduncle densely clothed with imbricate scales; anthers 5–8 in each flower, usually 3-celled, cells dehiscing longitudinally. *Female flowers* solitary, ovate, about $2\frac{1}{2}$ lin. wide, distinctly stalked; scales fleshy, 2-ovuled. *Seed* almost always solitary in each flower, naked, ovoid, about $1\frac{1}{4}$ in. long, the outer coat thick and fleshy, the inner hard and horny. *Embryo* small, cylindric, axial in the upper part of the albumen; cotyledons 2, short.

Fig. 1, transverse section of a leaf; 2, a male inflorescence; 3, bract from the base of a male flower; 4 and 5, anthers; 6, a female flower; 7, an advanced ovule; 8, section of a ripe seed; 9, embryo:—*all except* 8 *enlarged.*

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TAB. 8286.

KITCHINGIA UNIFLORA.

Madagascar.

CRASSULACEAE.

KITCHINGIA, *Baker in Journ. Linn. Soc. Bot.* vol. xviii. (1881), p. 268.

Kitchingia uniflora, *Stapf in Kew Bull.* 1908, p. 258; affinis *K. gracilipedi*, Baker, sed foliis brevissime pedicellatis, floribus minoribus saepissime solitariis et staminibus in corollae fundo insertis, carpellis maturis lanceolatis distincta.

Herba humilis, caulibus prostratis e nodis radicantibus glabris. *Folia* opposita, obovata, obtusa, utrinque 1-2-crenata, 7–15 mm. longa, 6–10 mm. lata, carnosa, laete viridia; petioli crassiusculi, 1–2 mm. (rarius ultra) longi. *Flores* terminales, solitarii vel interdum terni; pedicelli filiformes, patule tenuiter pubescentes, purpurascentes, florum solitariorum ad medium minute bibracteolati. *Calyx* alte 4-fidus, segmentis late ovatis minute apiculatis, parce pubescens, 3–3·5 mm. altus. *Corolla* inflato-tubulosa, basin et os versus constricta, 4-dentata, circiter 2–2·5 cm. longa, medio 12 mm. lata, pulchre carminea, parce et tenuiter glanduloso-pilosa, dentibus late ovatis obtusiusculis. *Stamina* in fundo corollae inserta, filamenta epipetala paulo altius orta et basi dilatata quasi cucullae (nectario?) incidentia, quam episepala longiora, normaliter 8, sed interdum nonnulla abortiva. *Disci* glandulae lineari-oblongae, 2-dentatae. *Carpella* fere libera, sub anthesi conniventia, anguste lanceolata, 6–8 mm. longa; styli ad 12 mm. longi. *Folliculi* sursum divergentes, 8–9 mm. longi.—O. STAPF.

The genus *Kitchingia* includes some ten species, all of which, except the one here figured, are certainly natives of Madagascar. The plant now described was raised from a cutting presented to Kew in January, 1908, by Mr. G. Bouvet, Director of the Jardin des Plantes at Angers; it resembles in habit some species of *Sedum* (the stems creep on the ground, rooting freely at the nodes), and now forms a patch some 12 in. across. In transmitting the plant Mr. Bouvet stated that the species appeared to have been originally introduced with other plants sent from Madagascar to Dr. Bontemps of Saumure. Since then, however, Mr. Bouvet has learned that the original plant was purchased in Belgium, and that its origin is not definitely known. From the fact that all its congeners are Mascarene there is, however, hardly room for doubt that *K. uniflora* is also a native of Madagascar. There is, indeed, in the herbarium at Kew a specimen collected by the late Rev. R. Baron in Northern Madagascar (*Baron* n. 6466), growing amongst moss and probably on a tree, that appears to be no more than a reduced form of our plant. The leaves of Baron's specimen are nearly orbicular, very obscurely crenate and only 2½–3 lin. long, while the flowers are only 8 lin. long; the staminal insertion and the shape of the carpels are, however, exactly as in *K. uniflora.* All the flowers originally sent by Mr. Bouvet and all those that have been produced at Kew have been solitary as shown in t. 8266, but we are informed by Mr. Bouvet that his plants which in 1908 had for the most part only solitary flowers, bore 3-flowered inflorescences in 1909. Normally the epipetalous stamens have longer filaments than the episepalous ones, and the total number of stamens is eight. But the absolute length of the stamens is subject to some variation, and occasionally some of the stamens may become much reduced or may even be suppressed. In the flowers sent by Mr. Bouvet in 1908 the shorter stamens almost reached the mouth of the corolla, while the longer ones were slightly exserted; in the specimen which flowered at Kew in 1909 the shorter stamens only reached the middle of the corolla, while the longer only exceeded them by the length of the anthers, and were also included. Mr. Bouvet informs us that among the flowers examined by him in 1909 he has found four with only six perfect stamens, and one with only five. Designating the stamens long, medium or short, according to whether they reached the mouth, the middle, or even a still lower level in the corolla tube, he has observed the following combinations:—(*a*) Five long, one medium; (*b*) four long, two short; (*c*) three long, three short; (*d*) one long, two medium, two short; (*e*) two medium, four short. The leaves of *K. uniflora* are thick and fleshy, glaucous green with reddish margins; the young stems also are red. Grown in a pan or a suspended basket in a mixture of peat and loam in a moist tropical house the plant increases rapidly. It flowers in spring.

DESCRIPTION.—*Herb*, stems prostrate and rooting at the nodes, glabrous. *Leaves* opposite, obovate, obtuse, 1–2-crenate along each side, 4–8 lin. long, 3–5 lin. broad, fleshy, bright green; petioles ½–1 lin. long, rarely longer.

Flowers terminal, solitary or occasionally ternate; pedicels filiform, thinly pubescent with spreading hairs, purplish, minutely 2-bracteolate near the middle when the flowers are solitary. *Calyx* deeply 4-lobed, lobes wide ovate and minutely apiculate, sparingly hairy, 1½–2 lin. long. *Corolla* inflated tubular, narrowed below and at the mouth, 4-toothed, nearly 1 in. long, 6 lin. wide at the middle, bright red, sparingly and finely glandular-pilose, the teeth wide ovate and somewhat obtuse. *Stamens* attached at the base of the corolla, the epipetalous filaments springing from a somewhat cucullate (perhaps nectarial) base at a somewhat higher level than the rather shorter episepalous filaments, normally 8, but occasionally some of them abortive. *Disk-scales* linear-oblong, 2-toothed. *Carpels* almost free, connivent in flower, narrowly lanceolate, 3–4 lin. long; styles about 6 lin. long. *Follicles* diverging upwards, 4–5 lin. long.

Fig. 1, a pair of leaves at a rooting internode; 2, calyx and pistil; 3, corolla, laid open, showing staminal insertion; 4, a disk-scale: – *all enlarged.*

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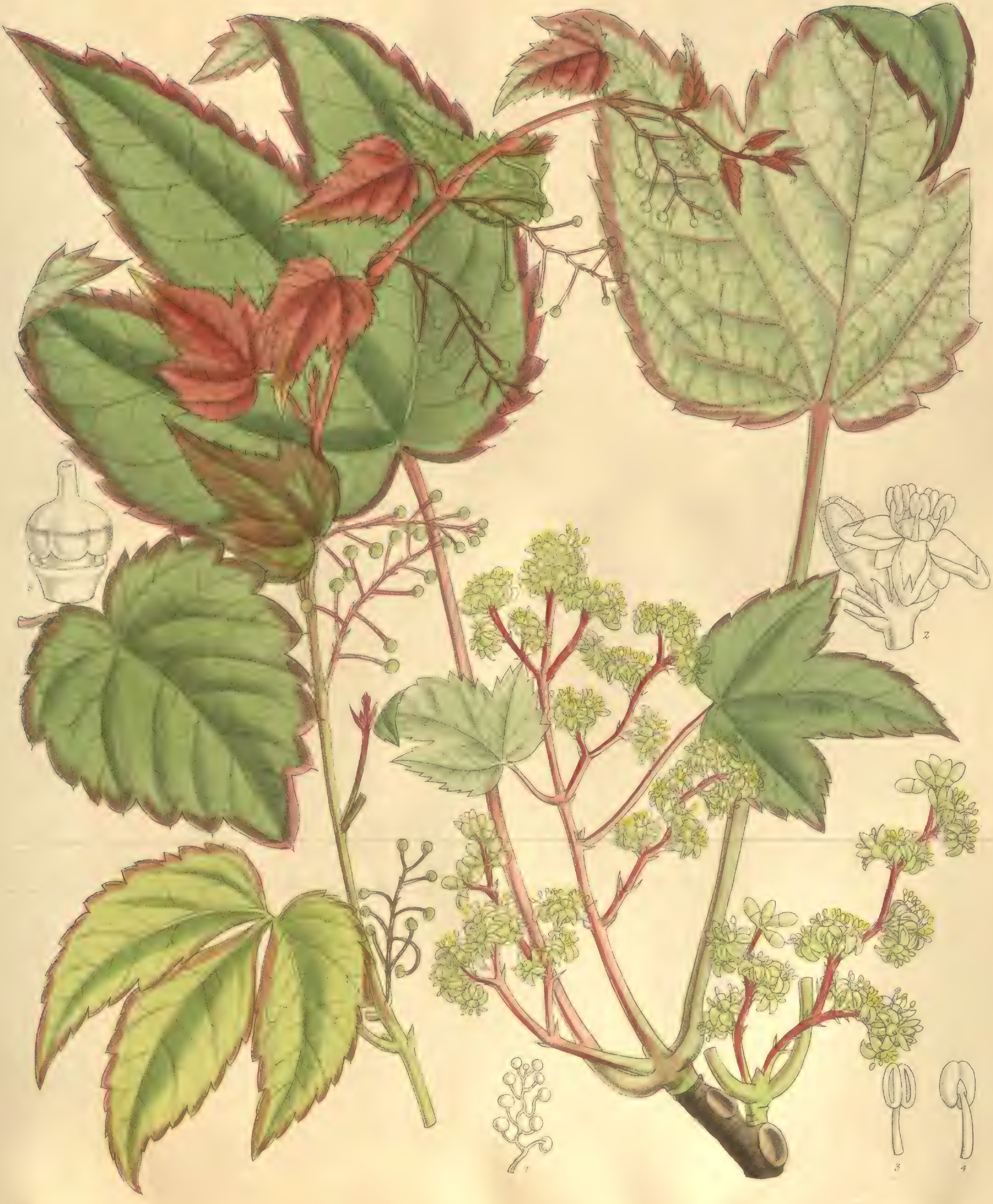

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Tab. 8287.

PARTHENOCISSUS TRICUSPIDATA.

Japan and China.

Ampelidaceae.

Parthenocissus, *Planch. in DC. Monogr. Phanerog.* 1887, vol. v. p. 447.—Vitis, *Benth. et Hook. f. Gen. Plant.* vol. i. p. 387, *partim; non Linn.*

Parthenocissus tricuspidata, *Planch. in DC. Monogr. Phanerog.* vol. v. p. 452; species cirrhis brevibus ramosis discigeris, foliis subtus fere glabris polymorphis nunc parvis indivisis nunc majoribus tricuspidatis rarius trifoliolatis plerumque grosse crenato-serratis insignis.

Frutex scandens, ramosissimus, heterophyllus, muris arborumque cortice arcte adhaerens, cirrhis brevibus ramosis oppositifoliis apicibus in discos facie interiore viscosos expansis; ramuli longi, polyphylli, et breves diphylli foliis suboppositis. *Folia* basi cordata, 5-nervia, grossiuscule crenato-serrata dentibus plerumque rotundatis mucronatis rarius acutis, supra nitida, glabra, subtus in nervis parce minute pilosa, ceterum glabra; folia superiora ramulorum longorum parva, circumscriptione ovata, indivisa vel leviter tricuspidata tantum, inferiora et folia ramulorum brevium magna—ad 25 cm. usque diametro, longe petiolata, circumscriptione suborbicularia, conspicue tricuspidata, rarius trifoliolata: in plantis juvenilibus folia majora plerumque trifoliolata; stipulae lanceolatae, membranaceae, deciduae. *Cymae* plerumque e ramulis brevibus ortae, interdum singulae, axillares, versus basin ramulorum longorum dispositae; ramuli breves cirrho non deciduo vel cyma aphylla terminati, nunc cymam in quaque axilla gerentes, cyma inferiore aphylla, superiore foliata, nunc cymam in axilla inferiore et ramulum longum in axilla superiore, nunc gemmam in axilla inferiore et cymam in axilla superiore gerentes; bracteae membranaceae; flores viriduli. *Calyx* cupularis fere truncatus. *Petala* 5, induplicato-valvata, apice uncato-inflexa, anthesi patentia marginibus inflexis, ovato-oblonga, circiter 4 mm. longa. *Stamina* erecta, petalis opposita; antherae introrsae, dorso glanduligerae. *Discus* ovarii dimidio inferiore adnatus, 5-sulcatus, glandularis. *Ovarium* 2-loculare; ovula pro loculo 2, collateralia, erecta; stylus vix 1·5 mm. longus stigmate inconspicuo. *Bacca* pruinosa, 1–2-sperma.—*P. Veitchii*, Graebn. in Gartenfl. 1900, vol. xlix. p. 249. *Ampelopsis tricuspidata*, Sieb. et Zucc. Fl. Jap. 1846, p. 88. *A. Roylei*, Kirchn. Arb. Musc. 1864, p. 152. *A. Veitchii*, Hort. ex Gard. Chron. 1868, p. 814. *A. japonica*, Hort. ex Gard. Chron. 1868, p. 1118. *Cissus Thunbergii*, Sieb. et Zucc. Fl. Jap. 1846, p. 87. *C. Veitchii*, Carrière in Rev. Hortic. 1877, p. 176. *Vitis inconstans*, Miq. in Ann. Mus. Bot. Lugd.-Bat. 1856, vol. i. p. 91. *V. capreolata*, K. Koch Dendrol. 1869, vol. i. p. 556; nec Don. *V. Veitchii* et *V. tricuspidata*, Lynch in Journ. Linn. Soc. Bot. 1879, vol. xvii. p. 308. *V. japonica*, Hort ex Nichols. Dict. Gard. 1884, vol. i. p. 66; nec Thunb. *Quinaria tricuspidata*, et *Q. Veitchii*, Koehne in Gartenfl. 1892, vol. xli. p. 403. *Psedera tricuspidata*, Rehder in Rhodora, 1908, vol. x. p. 29.—T. A. Sprague.

December, 1909.

No climbing plant ever introduced to Great Britain is more generally cultivated than the subject of our plate. Supporting itself on walls without artificial aid, by the viscous at first capitate but ultimately disk-like tips of its tendrils, it gives little trouble to grow, and is now more frequently planted as a creeper on town and suburban houses even than the Ivy. The leaves acquire the most beautiful of autumn tints, and, being deciduous, do not produce the dark winter effect that in some places renders Ivy unsuitable. Nearly allied to the familiar Virginian Creeper, *Parthenocissus quinquefolia*, which also has viscous tendril-tips, the plant here figured, when brought into general cultivation in 1868 by Messrs. J. Veitch and Sons, was distributed as *Ampelopsis Veitchii* and *A. japonica*. Quite recently, authorities so careful as Koehne and Graebner have once more endeavoured to discriminate between these two plants, but it is generally conceded that they represent no more than two states of a single species for which the most familiar garden name is *Ampelopsis Veitchii*. In works which accept the view enunciated in the Genera Plantarum, where the genus *Vitis* is made to include all the Ampelidaceae except the species of *Pterisanthes* and of *Leea*, our plant is known as *Vitis inconstans*, a name which is, however, somewhat less familiar than that under which it was issued by the Messrs. Veitch. But this view is now almost universally considered too comprehensive, and writers who, like Mr. Sprague, follow the careful monograph by Planchon, where the *Vitis* of the Genera Plantarum is subdivided into nine distinct genera, are precluded from using either of these familiar names. Our plant is neither a *Vitis*, in the narrower sense in which that name was originally and is now again more satisfactorily employed, nor a genuine *Ampelopsis*; it is a member of the genus which Planchon has termed *Parthenocissus*, readily distinguishable from the other genera of Ampelidaceae grown out of doors in this country by having viscous tendril-tips, by the absence of tendrils from the inflorescence, and by the glandular hypogynous disk being entirely adnate to the ovary. *P. tricuspidata* has shoots of two distinct kinds—long shoots and short. The long shoots bear several leaves with leaf-opposed tendrils and axillary branchlets, two successive leaves having a tendril opposite to them, and the third a branchlet in its axil. The short shoots produce only two leaves in each year; these leaves are nearly opposite, and each has a branch or bud in its axil; the shoot itself may end either in a tendril, which soon disappears, or in a cyme. Three combinations are met with as regards the axillary branches. There may be a cyme in each axil; or there may be a cyme in the axil of the lower and a long shoot in that of the upper leaf; or, finally, there may be a vegetative bud in the lower axil, which will continue the growth of the short shoot in the following season, and a cyme in the upper. Trifoliolate leaves are characteristic of young plants; in this condition *P. tricuspidata* bears a superficial resemblance to the juvenile state of the Poison Ivy, *Rhus Toxicodendron*, and recently a good deal of unnecessary alarm has been caused by the confusion of the two in a popular article. The plant now figured is quite harmless, and is readily distinguished by its leaves being mostly simple; the *Rhus* never has simple leaves. *P. tricuspidata* is most easily cultivated, and will thrive in almost any soil. Propagation is effected by means of cuttings placed in gentle heat. The young plants should be grown in pots until planted out in permanence, as they do not transplant well.

DESCRIPTION.—*Shrub*, climbing by means of short, much-branched, leaf-opposed tendrils with discoid viscous tips; twigs of two kinds, long with several leaves and short with 2 nearly opposite leaves. *Leaves* polymorphic, cordate and 5-nerved at the base, rather coarsely crenate-serrate, the teeth usually rounded, mucronate, less often acute, glabrous and shining above, finely puberulous on the nerves beneath, those of the long shoots mostly small, ovate, entire or slightly 3-cuspidate; the lower leaves of long shoots and those of the short shoots much larger, up to 10 in. long, with long petioles, nearly orbicular, markedly 3-lobed or occasionally 3-foliolate, in young plants still larger and usually 3-foliolate; stipules lanceolate, membranous, deciduous. *Cymes* mostly from the short shoots, some also from low down on the long shoots, their arrangement regulated by the mode of growth which is sympodial at two succeeding nodes and monopodial at the third; bracts membranous; flowers greenish. *Calyx* cup-shaped, somewhat truncate. *Petals* 5, induplicate-valvate, inflexed at the tip, spreading in flower, with inturned margins, ovate-oblong, about 2 lin. long. *Stamens* erect, opposite the petals; anthers introrse, glandular on the back. *Disk* adnate to lower half of ovary, 5-grooved, glandular. *Ovary* 2-celled, cells 2-ovuled; ovules collateral, erect; style less than 1 lin. long, stigma minute. *Berry* pruinose, 1–2-seeded.

Fig. 1, a branched tendril; 2, flowers; 3 and 4, stamens; 5, pistil:—*all enlarged.*

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TAB. 8288.

ASPARAGUS TETRAGONUS.

South Africa.

LILIACEAE. Tribe ASPARAGEAE.

ASPARAGUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 765.

Asparagus tetragonus, *Bresler, Gen. Aspar. Hist.* No. 15; *Schult. f. Syst. Veg.* vol. vii. p. 329; species ex affinitate *A. racemosi*, Willd., cladodiis brevioribus perianthii segmentis obtusis exterioribus apice eroso-laciniatis differt.

Suffrutex sarmentosus. *Radix* tuberis pluribus translucentibus ellipticis 3 cm. longis. 1·5 cm. latis instructa. *Caulis* teres, aculeis decurvis robustis lignosis 12 mm. longis instructus; ramuli acute triangulares, recti, angulis scabris. *Cladodia* saepius quinatim fasciculata, trigona vel tetragona, linearia, 14 mm. longa, mucronata, basi incrassata. *Racemi* plures, 6 cm. longi, patentes; bracteae 1·5 mm. longae, membranaceae, brunneae; pedicelli 3 mm. longi, infra medium articulati. *Perianthii* segmenta obovata, 3 mm. longa, alba, obtusa, exteriora eroso-laciniata, interiora obscure dentata. *Stamina* quam perianthium paullo breviora; antherae 0·4 mm. longae, obtusae, dilute roseae. *Ovarium* ampullaeforme; stylus brevis, crassus, trilobatus. *Bacca* globosa, 6 mm. in diametro, coccinea.—*A. racemosus*, var. *tetragona*, Baker in Journ. Linn. Soc. vol. xiv. p. 624, et in Dyer, Fl. Cap. vol. vi. p. 269.—C. H. WRIGHT.

Asparagus tetragonus is a member of the group of species of which *A. racemosus*, Willd., is the best known example. The general resemblance between these two species is considerable, and it has even been suggested that the subject of our plate may be no more than a variety of Willdenow's species, which is a native of Tropical Asia and Africa. But *A. tetragonus*, which is a native of South Africa, and was first collected by Mund and Maire in Cape Colony, has broader perianth segments, the outer ones at least being almost laciniate, than is the case in *A. racemosus* where the perianth segments are oblanceolate, somewhat acute, and quite entire. The spines of the two species also differ somewhat, those of *A. tetragonus* being stout and decurved, whereas those of *A. racemosus* are often straight and slender. In both species the cladodia vary considerably; in the case of *A. tetragonus* some are compressed with a thick prominent rib on both faces and others are distinctly

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trigonous; the majority, however, are almost equally tetragonous. The plant from which the figure now given has been prepared is one that has been grown for many years in the Succulent House at Kew, where, planted in a shallow border, its stems attain a length of over 10 ft. These are woody at the base and armed with rather formidable spines. The flowers, which are produced freely in autumn and are very fragrant, are succeeded by red globose one-seeded berries. Like some allied species, *A. tetragonus* has a root system remarkable for the large, whitish, watery, ovate tubers which are formed along the principal roots, and are calculated to enable the plant to endure prolonged periods of drought. *A. tetragonus* is not difficult to grow, and is a useful plant for clothing pillars in a conservatory.

Description. — *Undershrub*, climbing; roots bearing numerous translucent, elliptic tubers, 1¼ in. long, ⅔ in. thick. *Stem* cylindric, armed with stout decurved woody thorns, 6 lin. long; twigs sharply triangular, straight, their angles scabrid. *Cladodes* usually in fascicles of 5, 3- or 4-angled, linear, 7 lin. long, mucronate, their bases thickened. *Racemes* rather numerous, 2½ in. long, spreading; bracts under 1 lin. long, membranous, brown; pedicels 1½ lin. long, jointed below the middle. *Perianth-segments* obovate, 1½ lin. long, white, obtuse, the outer distinctly erosely lobulate, the inner faintly toothed. *Stamens* rather shorter than the perianth; anthers under ½ lin. long, obtuse, faintly rose-coloured. *Ovary* subglobose; style short, thick, 3-lobed. *Berry* globose, 3 lin. broad, pink.

Fig. 1, fascicle of cladodes; 2, a flower; 3 and 4, stamens; 5, pistil:—*all enlarged.*

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TAB. 8289.

PRUNUS MARITIMA.

Eastern North America.

ROSACEAE. Tribe PRUNEAE.

PRUNUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 609.

Prunus (Euprunus) maritima, *Wangenh. Am.* 1781, p. 103; *Britton et Brown, Ill. Fl.* vol. ii. p. 249; *Bailey, Cycl. Am. Hort.* 1449; *Schneider, Ill. Handb. Laubholzk.* vol. i. p. 624; affinis *P. Gravesii*, Small, a qua foliorum forma et putamine utrinque acuto vel subacuto differt.

Frutex ad 3 m. usque altus, ramis primariis decumbentibus, secundariis erectis vel suberectis, cortice plus minusve cinereo glabro. *Folia* elliptica vel obovata, basi plus minusve cuneata vel leviter rotundata, apice plerumque subacuta, 4–7 cm. longa, 2–3·5 cm. lata, serrata, utrinque pubescentia vel glabra, nervis utrinque 6–8 subtus elevatis; petioli usque ad 8 mm. longi, breviter pubescentes; stipulae oblongae, ciliatae, deciduae. *Corymbae* breves, usque ad 10-florae; pedicelli circiter 1 cm. longi, pubescentes. *Receptaculum* fere campanulatum, 2·5 mm. longum, extus breviter pubescens, intus glabrum. *Calycis* segmenta ovata, apice rotundata, 1·5 mm. longa, utrinque pubescentia, marginibus inflexis. *Petala* alba, latissime obovata vel suborbicularia, 6–7 mm. longa, 5–6 mm. lata, superne crenata. *Stamina* 18–25; filamenta subaequalia. *Carpellum* ellipsoideum, glabrum; stylus robustus, 3·5 mm. longus, glaber, apice minute bifidus. *Drupa* oblongo-ellipsoidea vel subglobosa, vix 2 cm. longa, rubro-purpurea, putamine utrinque acuto vel subacuto.—*P. sphaerocarpa*, Michx Fl. Bor. Am. vol. i. p. 284. *P. pubescens*, Poir. in Lamk Encyc. Meth. Suppl. vol. iv. p. 584. *P. littoralis*, Bigel. Fl. Bost. ed. 2, vol. ii. p. 193.—J. HUTCHINSON.

The Shore Plum, here figured, occurs on the sands of the Atlantic sea-shore from New Brunswick to Virginia, and is also met with at the head of Lake Michigan. Chapman indeed (Flora of the Southern United States, ed. 3, p. 131) records it from Alabama; the basis of this record is, however, a very imperfect specimen collected by Buckley in the Alleghany Mountains, and Sargent (Sylva of North America, vol. iv. p. 28) is probably justified in concluding that, as no other trace of *P. maritima* has been met with in this now well-explored region, the specimen obtained by Buckley merely represents a form of *P. alleghaniensis*. Porter. The nearest ally of *P. maritima* is *P. Gravesii*,

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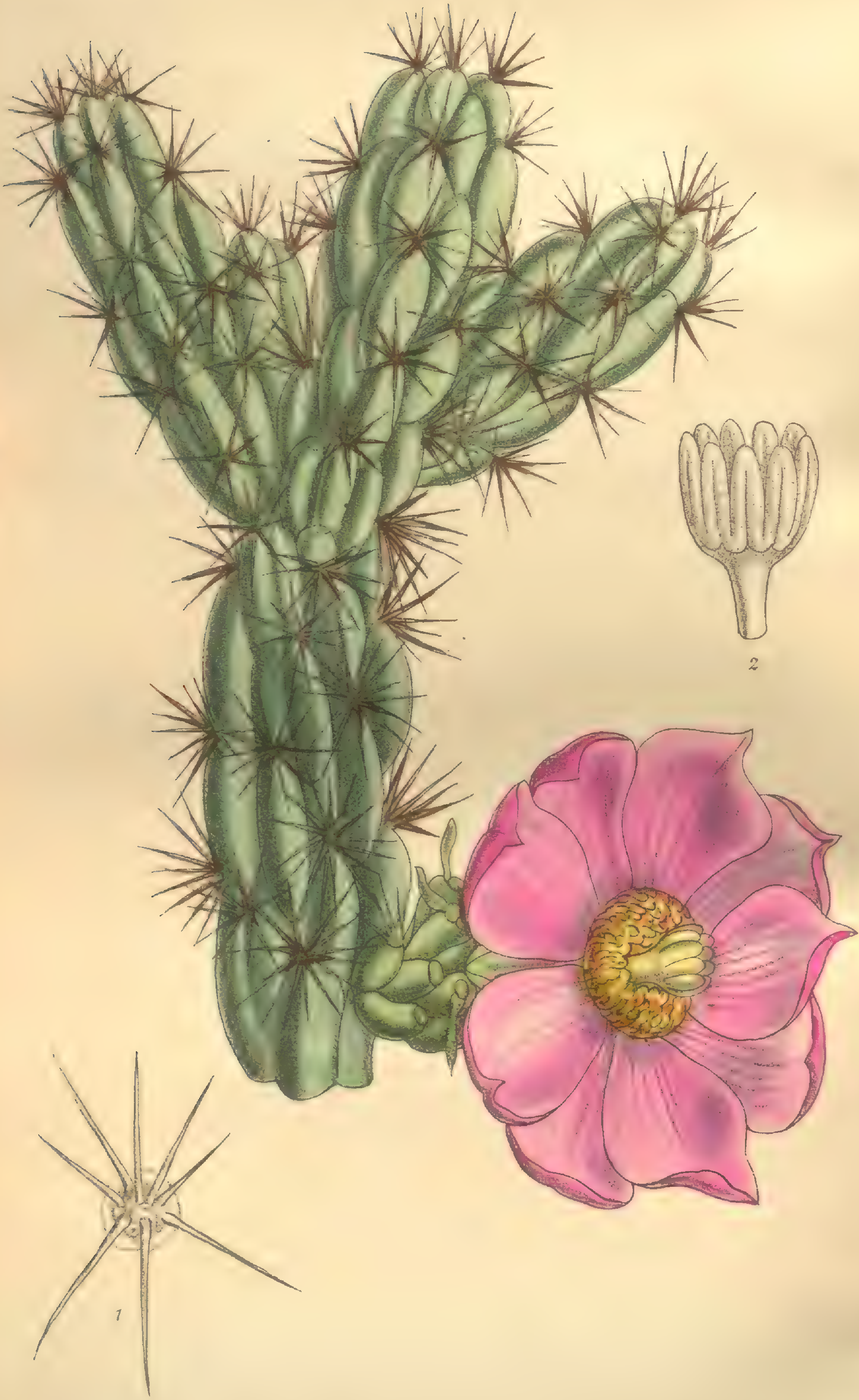
Small, from which our plant appears to differ mainly in the shape of the leaves and in having a stone which is more or less pointed at both extremities. The plant from which our figure has been prepared has long existed in the Kew collection. It flowers in May, and not only produces its blossoms in great profusion, but keeps them in perfection longer than most Plums do. At Kew it forms a low spreading bush, 4–5 ft. high, and considerably more in width. Judging by the localities in which it grows wild, it ought to prove useful for planting in fairly exposed places near the sea. It appears to possess a very robust constitution, and is one of the most accommodating of American Plums in regard to soil. It is, however, rather subject to attack by the aphis which so frequently infects the young shoots of Plums and causes the leaves to curl up into shapeless masses. *P. maritima* produces its fruit in sufficient quantity to afford ample means of propagation; it can also be budded on ordinary plum-stocks.

DESCRIPTION.—*Shrub*, 4–5 ft. high in cultivated specimens, reaching 12 ft. in wild specimens; main branches decumbent, the secondary erect or nearly so; bark smooth, more or less ash-grey. *Leaves* elliptic or obovate, more or less cuneate or somewhat rounded at the base, acute or subacute at the tip, 1½–1¾ in. long, ¾–1¼ in. broad, serrate, pubescent or glabrous, nerves 6–8 on each side, raised beneath; petiole 4 lin. long or less, finely pubescent; stipules oblong, ciliate, deciduous. *Corymbs* short, 10- or fewer-flowered; pedicels about 5 lin. long, pubescent. *Receptacle* almost campanulate, 1½ lin. long, slightly pubescent outside, glabrous within. *Calyx-lobes* ovate, rounded at the tip, under 1 lin. long, with inflexed edges, pubescent on both sides. *Petals* white, wide obovate or nearly orbicular, 3–3½ lin. long, 2½–3 lin. broad, crenate at the tip. *Stamens* 18–25, their filaments nearly equal. *Carpel* ellipsoid, glabrous; style stout, nearly 2 lin. long, glabrous, slightly 2-fid at the tip. *Drupe* oblong, ellipsoid, or nearly globose, about 10 lin. long, red-purple; stone more or less pointed at both ends.

Fig. 1, base of leaf and stipules; 2, section of a flower, the petals removed; 3, petal; 4 and 5, stamens; 6, stone of the fruit:—*all except* 6 *enlarged.*



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TAB. 8290.

OPUNTIA IMBRICATA.

Mexico and South-western United States.

CACTACEAE. Tribe OPUNTIEAE.

OPUNTIA, *Mill.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 851.

Opuntia imbricata, *DC. Prodr.* vol. iii. p. 471; *K. Schum. Monogr. Cact.* p. 668; species ex affinitate *O. tunicatae,* Link et Otto, sed elatior et ab ea spinis numerosioribus brevioribus floribusque kermesino-purpureis valde diversa.

Frutex 1–2 m. altus vel *arbor* 3–4 m. alta, trunco 12-25 cm. crasso. *Rami* verticillati, patentissimi vel adscendentes; ramuli 4–16 cm. longi, 2–3 cm. crassi, cylindrici, glaucescenti-virides, tuberculati tuberculis costas breves 1·5-3·5 cm. longas compressas formantibus. *Pulvilli* depressi, breviter tomentosi. *Folia* teretia, patula, 1·2–2 cm. longa. *Aculei* 8–30, stellatim divaricati, 6-20 (raro 25–30) mm. longi, cornei vel fusci, vaginis arcte vestiti, 1–8 interiores longiores. *Flores* 5-7·5 cm. diametro, kermesino-purpurei. *Ovarium* 20–25-tuberculatum, superne parce foliosum; pulvilli setis paucis deciduis instructi. *Sepala* 8-13, obovata, obtusa vel retusa, viridia, purpureo-marginata. *Petala* 10–12, 2-seriata, obtusa vel retusa, breviter vel brevissime apiculata, kermesino-purpurea. *Stamina* numerosissima; filamenta purpurea; antherae luteae. *Stigmata* 8–10, lutea. *Fructus* subglobosus vel hemisphaericus, apice planus vel depressus, circiter 2·5 cm. diametro, tuberculatus, inermis, luteus.—*O. rosea,* DC. Prodr. vol. iii. p. 471; Mem. Mus. Hist. Nat. vol. xvii. p. 66, t. 15; Pfeiff. Enum. Diagn. Cact. p. 171; Foerst. Handb. Cact. ed. 2, p. 986, fig. 134. *O. arborescens,* Engelm. Bot. Wislez. Exped. p. 6; Pacif. Rail. Rep. vol. iv. pp. 51 et 58, t. 17, fig. 5, 6: t. 18, fig. 4: t. 24, fig. 12: t. 75, fig. 16, 17; Foerst. Handb. Cact. ed. 2, p. 984. *O. stellata,* Salm Dyck, Hort. Dyck. pp. 50 et 250; Engelm. in Bost. Journ. Nat. Hist. vol. vi. p. 208 (sub *O. arborescente*). *Cereus imbricatus,* Haw. Rev. Pl. Succ. p. 70.—N. E. BROWN.

Opuntia imbricata is a native of the dry interior of Central and Northern Mexico and of the adjacent regions to the north; its range extends through Arizona, New Mexico and Western Texas as far north as Pikes Peak in Colorado. For the material from which the figure now given has been prepared we are indebted to Sir E. G. Loder, Bart., in whose collection at Leonardslee, Horsham, a plant which he had himself collected in Colorado in 1878 flowered early in August, 1908. This species is a member of a small group of Opuntias characterised by their cylindric

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stems with short ridge-like compressed tubercles and by the sheaths that cover their spines. It is the commonest member of the group to which it belongs in European gardens, and was first introduced to cultivation in the earlier years of the nineteenth century. In spite of this, however, it is a plant whose flowers, which are very attractive but which will only expand under the influence of direct sunshine and unfortunately do not last long, are not often seen in the United Kingdom. Sir Edmund Loder informs us that his example at Leonardslee has but seldom flowered; when it did so in 1908 this happened during a time of very hot, sunny weather, and individual flowers only remained fully open during one afternoon, from about midday till sunset.

DESCRIPTION.—*Shrub*, 3–7 ft. or a small tree up to 15 ft. high, its trunk 5–10 in. thick with whorled spreading or ascending branches; twigs 2–10 in. long, about 1 in. thick, cylindric, glaucous green, covered with compressed tubercular ribs $\frac{3}{4}$–$1\frac{1}{2}$ in. long; leaves terete, spreading, $\frac{1}{2}$–$\frac{3}{4}$ in. long; spine-bearing cushions depressed, shortly tomentose; spines in clusters of 8–30, stellately spreading, 3–10 (rarely 12–15) lin. long, grey or tawny, closely sheath-clad, the inner 1–8 longer than the others. *Flowers* 2–3 in. across, bright purple. *Ovary* with 20–25 tubercles, sparingly leafy in the upper part; the cushions bearing numerous deciduous bristles. *Sepals* 8–13, obovate, obtuse or retuse, green with purple edges. *Petals* 10–12, in two rows, obtuse or retuse, shortly or very shortly apiculate, bright purple. *Stamens* very many; filaments purple; anthers yellow. *Stigmas* 8–10, yellow. *Fruit* sub-globose or hemispheric, the top flat or depressed, about 1 in. across, yellow, tubercled but without spines.

Fig. 1, cluster of spines; 2, stigmas:—*both enlarged.*

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TAB. 8291.

EURYOPS VIRGINEUS.

South Africa.

COMPOSITAE. Tribe SENECIONIDEAE.

EURYOPS, *Cass.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 452.

Euryops virgineus, *Less. Syn. Comp.* p. 394; *DC. Prodr.* vol. vi. p. 445; *Harv. in Harv. et Sond. Fl. Cap.* vol. iii. p. 411; affinis *E. algoensi*, DC., sed capitulis minoribus achaeniisque glabris differt.

Frutex virgatus, 30–60 cm. altus, ramis teretibus glabris flavo-viridibus; ramuli floriferi circiter 10 cm. longi. *Folia* viridia, cuneata, alte 3–5-lobulata, 0·5–1 cm. longa, ad 0·5 cm. usque lata, coriacea, glabra. *Capitula* solitaria, axillaria, subcorymbosa, post anthesin racemosa, 1·5 cm. diametro; pedunculi erecti, graciles, ad 2·5 cm. usque longi, glabri; involucri bracteae basi connatae, ovato-lanceolatae, acutae, 2–4 mm. longae, membranaceae, glabrae, trinerviae. *Flores radii* 6, flavi; tubus 1 mm. longus, glaber; limbus oblongus, 6 mm. longus, 2–2·5 mm. latus, apice tridentatus. *Flores disci* superne campanulati, lobis triangularibus obtusis. *Antherae* appendiculatae, 1 mm. longae. *Achaenia* subteretia, glabra; pappi setae albae, patentes; styli rami 1 mm. longi.—*E. flabelliformis*, Cass. in Dict. Sc. Nat. vol. xvi. p. 51. *Othonna virginea*, Linn. f. Suppl. p. 309; Thunb. Prod. Pl. Cap. p. 168.—J. HUTCHINSON.

The genus *Euryops* includes, so far as it is at present known, some 40 species, all of which are confined to the African Continent and the island of Socotra. It is nearly allied to the genera *Senecio*, Linn., and *Othonna*, Linn.; from the former *Euryops* only differs in having connate involucral bracts which are not provided with calcycine appendages; from the latter it is distinguished by the fact that the florets of the disk are fertile. Most of the species of *Euryops* have thick fleshy leaves. The species now figured is a native of the coast region of Cape Colony, where it is found on stony veldt from Knysna to Albany. It is nearly allied to *E. algoensis*, DC., a native of the same region which has larger leaves, villous achenes and fewer but larger flower-heads. *E. virgineus* was first introduced to English gardens about 1821, and can be successfully grown in sheltered situations in the south-western parts of Britain. The material from which our plate has

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been prepared was communicated to Kew by Mr. T. A. Dorrien Smith, in whose garden at Tresco Abbey, Isles of Scilly, it thrives luxuriantly and flowers profusely in March and April.

DESCRIPTION.—*Shrub*, 1–2 ft. high, fastigiately branched, the branches cylindric, glabrous, yellowish green; flower-bearing twigs about 4 in. long. *Leaves* green, cuneate, deeply 3–5-lobulate, 3–5 lin. long, 2–2½ lin. broad, coriaceous, glabrous. *Heads* solitary, axillary, at first nearly corymbose, at length raceme-like, 8 lin. across; peduncles erect, slender, reaching 1 in. in length, glabrous; bracts of the involucre connate at the base, ovate-lanceolate, acute, 1–2 lin. long, membranous, glabrous, 3-nerved. *Ray-florets* 6, yellow; tube ½ lin. long, glabrous; limb oblong, 3 lin. long, 1–1½ lin. broad, the tip 3-toothed. *Disk-florets* campanulate above, with triangular obtuse lobes. *Anthers* appendaged, ½ lin. long. *Achenes* nearly terete, glabrous; pappus hairs white, spreading; style arms ½ lin. long.

Fig. 1, a leaf; 2, a flower-bud; 3, ray-floret; 4, disk-floret; 5, anthers; 6, pappus hair:—*all enlarged.*

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